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THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

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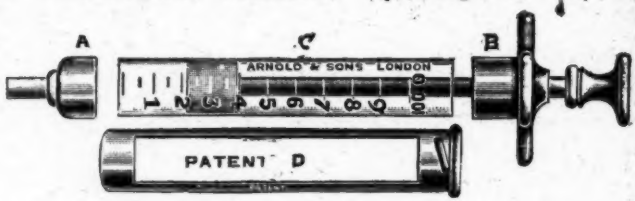

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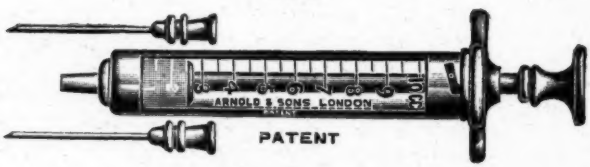

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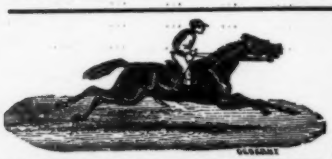

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HERR SCHMIDT, OF KOLDING, DENMARK.

THE

VETERINARY JOURNAL

MARCH, 1910.

HERR SCHMIDT, OF KOLDING.

No country practitioner of any nationality is better known in in the veterinary or agricultural world than Herr Schmidt, of Kolding, in Denmark. Had he chosen to be of a selfish turn of mind, and to have kept his discovery to himself, he might have made an enormous fortune for his researches into the treatment of milk fever, and the generous publication of his results have been the means of saving hundreds of thousands of pounds worth of cattle, and of converting what used to be a tedious and thankless task for the country practitioner into one which he now undertakes with a light heart.

Born near Haderslev on July 15, 1845, he took his veterinary diploma at Copenhagen in 1872, starting in practice at Smidstruys, and eventually settling down at Kolding. There he soon gained the confidence of the farmers, and by his carefully recorded observations speedily made a name amongst his veterinary colleagues as a skilful and observant practitioner.

As a result of his researches into tuberculosis, he published a scheme in 1886 which he had worked for several years with success, and which had acted very satisfactorily in checking this disease in his district. He was the pioneer of the idea that farmers should have their cattle examined at least once a year regularly by a veterinary surgeon, and have the suspected animals isolated and disposed of by fattening or otherwise, so that the loss might be minimized as far as possible.

One of his suggestions, too, was that the milk of suspected cows should not be used for feeding purposes until it had previously been boiled. These ideas were carried out with excellent success as regards the result on the stock in his district, and a few years later were elaborated into the more stringent investigations and application of the tuberculin test by Professor Bang, whose scheme for stamping out tuberculosis in the cattle of Denmark has met with such splendid results. Herr Schmidt's researches into the study of milk fever in cows were first published in 1897, and it needs no words on our part to say how far-reaching and valuable those results have been. In every civilized country of the world Schmidt's treatment is carried out, and the number of lives which have been saved by the treatment alone can be counted in hundreds of thousands. As was stated by Professor Degive at the International Veterinary Congress at Buda Pesth in 1905: "Par sa methode thérapeutique notre confrère Schmidt a rendu à l'Agriculture et á la fortune publique des services incalculables. Du même coup il a élevé la valeur et le prestige de la Médecine Vétérinaire."

Herr Schmidt has been decorated by the King of Denmark as a Knight of Danebroge, and has been awarded a vote of thanks, together with an annual premium, by the Danish Parliament; also in many countries of the world (including Great Britain) he has been honoured with the degree of Membership of many Veterinary and Agricultural Societies.

He still takes the greatest interest in all matters pertaining to his profession, and was present at the last International Veterinary Congress at the Hague. His colleagues in England trust that it may be their good fortune to have the opportunity of welcoming him in London in four years' time, when the next Congress holds its Session in this City.

THE excellent photograph of the late Mr. A. Wheatley, which we reproduced in our last issue, was by Mons. Sala Arbus and Sons, Reading.

Editorials.

STERILITY IN CATTLE.

WE need offer no apology for giving an excellent article on the above subject this month by Mr. Albrechtsen, a Danish veterinary surgeon, although the subject was very thoroughly and ably dealt with by Professor Hess in his paper, which we reproduced last month. The subject-matter is of the highest importance to breeders in this country, and yet it has had very scant attention in the shape of systematic investigation. These two observers have shown quite clearly that sterility is very frequently due to some curable disease of the genital passages, sometimes contagious and sometimes non-contagious. Professor Hess considers that in Switzerland the commonest cause of the condition is infectious granular vaginitis, a disease certainly present in this country, but which would appear not to have been recognized until lately. Mr. Albrechtsen says that in Denmark a chronic catarrhal inflammation of the uterus is the main cause of the trouble, and he quotes in proof the successes obtained by rational treatment of that affection.

Now both these conditions exist here as well as on the Continent of Europe and elsewhere, and yet we know of no systematic endeavour to diagnose and treat them on farms where sterility is almost causing the ruin of the farmer. Obviously antiseptic irrigation of the affected organs is the line of treatment to be adopted, but care must be taken that in the case of the uterus the irrigating fluid must certainly be injected into the womb through the os uteri, or this treatment will be useless.

The subject of sterility is very intimately associated with abortion, and it would confer a great boon upon the agricultural community if the commission, now investigating abortion, were to be instructed to extend their researches to include sterility in cattle. However, veterinary practitioners carefully reading the articles by Professor Hess and Mr. Albrechtsen will be in a much better position than before to advise their clients on this most important question.

THE TREATMENT OF WOUNDS.

A YEAR ago in the VETERINARY JOURNAL we reproduced a most instructive article on the above subject by Sir W. Watson Cheyne, in which he argued strongly in favour of the *antiseptic* treatment of wounds as opposed to the more recently introduced method of *aseptic* treatment. We were especially pleased with it, owing to the fact that it is possible to undertake his line of treatment, rational Listerism, in veterinary practice with hope of success, whereas this so-called aseptic method is obviously impracticable owing to the conditions under which our operations have to be performed, and the great difficulty in procuring protection against possible infection of wounds after operation. The excellent results that are obtained in veterinary surgery when attention is paid to detail in antiseptic treatment, in spite of the great difficulty of subsequent control (our patients cannot be persuaded to lie for days between clean sheets), speak for themselves. It is little to be wondered at that we cannot claim quite the same results as in human surgery, but our proportion of operation wounds healing without stitch abscess formation by first intention is rather remarkable to say the least.

As a set-off against Sir W. W. Cheyne's article, the surgeons at another hospital, where the aseptic method is now in vogue, have collected records of their present results, and contrasted them with the less favourable results they obtained formerly under the antiseptic method. Elsewhere in this issue (p. 154 *et seq*), we reproduce Sir W. W. Cheyne's reply to the argument adduced by those results. He states the case in a most masterly manner, and completely upsets all their conclusions by quoting the results obtained by himself for some years past, which are very considerably better than those claimed for the aseptic method, and he very cogently suggests that if those results are the best that can be claimed for the new method, the sooner it is discarded the better. The article is of special interest, and especially so if read in conjunction with his original article to which we have referred.

NOTIFICATION OF CONTAGIOUS DISEASES OF ANIMALS.

WE wish to draw our readers' attention to the Order of the Board of Agriculture and Fisheries on p. 176 instituting payment for notification by a veterinary practitioner of the existence of suspected existence of scheduled diseases of animals amongst his patients. It must be noted that the Order is compulsory, not optional, as the Order states, that "a veterinary practitioner . . . *shall* with all possible speed give notice, &c." A new principle is also introduced with this Order in the form of the payment of a fee of 2s. 6d. for notification of each case or outbreak.

The Order is to come unto force on the first day of next month (April).

THE IMPORTANCE OF CLINICAL OBSERVATION.

THE lessons of the laboratory can only be of vital use to the medical or surgical world when they have been proved by the clinician. It is the latter, the man whose life brings him in daily contact with animal suffering, whether of man or the brute creation, who must give the final opinion and make the tests which will decide as to whether the preliminary laboratory work was of real *practical* value or not.

Without the application and observation of the clinician the greater part of laboratory work would be valueless in its effects to benefit the world. The two are indissolubly connected, and neither can take precedence in what is the primary aim of all who embark upon the study of medicine, viz., the fight against disease.

Indexed B. A. I.

General Articles.

STERILITY OF THE COW AND ITS RELATION TO INFECTIOUS DISEASES OF THE GENITAL ORGANS.

By Herr ALBRECHTSEN.

Veterinary Surgeon, Aakirkeby, Denmark.

To us in Denmark, where butter production brings in the greatest profit, sterility of the cow is of great and far-reaching importance, because through it the homesteads of our country suffer, there is no security in breeding, and milk supply lessens, great loss resulting.

The milk cow, in order to produce as great a profit as possible, must not only have regularly occurring periods of pregnancy, but parturition must occur in our country in autumn or early winter.

The animals are then fresh milking at a time when we have the most and best food; for only occasionally do we find proprietors whose operations are so directed that they have equally good nourishing material all the year round. If breaks happen in regularly occurring pregnancy, so that the cow is either excluded from propagating her species, absolute sterility or the subsequent calving is delayed for a longer or shorter time; in relative sterility usefulness will decline; the same will also be the case if pregnancy ends before the time—that is if the animal aborts. Relative sterility called, by the name of "Ueberlaufen," as well as abortion, is the most frequent occurring form here in Denmark. As in other countries, so with us, commonly operating causes must be reckoned with, which should especially be sought in the one-sided development to which the milk cow has been for many years subjected, and in the rich and very often artificial nourishment given, which clearly produces a certain disposition to sterility.

As regards the direct influencing factors, preference has been given to cystic degenerations, and in the last year to the *corpus luteum persistens*. As a recent thing also, according to Swiss authority, a vaginitis et metritis follicularis, which in the chronic form has spread very widely, has been charged with and accepted as causing aconception in non-pregnant animals, and abortion in in-calf animals. Further, we know very well that certain uterine affections, especially at the cervix, lead now and then to sterility. It is well known, also, that cows, which after parturition have suffered from metritis septica

[1] Ninth International Veterinary Congress, Hague, 1909.

(occasioning retentio secundarem, wholly or partially, torsio uteri, and so on), frequently become quite sterile, or for a long time keep coming on heat, the last named being caused by chronic metritis or endometritis.

That uterine ailments now and then lead to sterility is a matter of daily experience; all authors who have written thereon have attributed a smaller significance to these diseases than to affections of the ovaries and vagina. One reckons only with the pronounced cases of uterine disease causing great discharge from the external genitalia and large collections in the uterus, whilst the chronically occurring and insignificant cases are wholly overlooked.

Post-mortems, examinations *per rectum*, and drawing out of the cervix through the vagina of the genitalia of many non-pregnant cows which showed abnormal symptoms of heat, have convinced me that in most animals of this kind there is a catarrhal affection of the uterine mucosa, leading generally to sterility, or at best to endometritis.

In the years 1905 and 1906, *post-mortems* on the genital organs of unfruitful cows were undertaken in the bacteriological department of the experimental laboratory, under the direction of Professor Bang and Assistant Tuff. Of ninety-seven organs examined, sixty-four, or 66 per cent., showed pathological changes. The most frequent-occurring disease was an interstitial endometritis, which was established in no fewer than fifty-eight cases. This affection occurred with and without change of the glands, whose number afterwards could be increased or diminished. In the former case the uterus was generally normal in size, the mucosa a little injected and covered with slime, the glands normal, the interstitial connective tissue enlarged, poor in cells, corded, and the vessel wall thickened.

In interstitial endometritis with diminution of the glands, the changes were more obvious, the cornua uteri asymmetric, the mucosa strongly injected covered with blood-tinged mucus, the glands in smaller number destroyed, or united in groups separated by firm connective-tissue bands. The gland-ducts were widened, tortuous, or wounded with serrate edges. Chronic metritis with visible changes in the uterus was only found in four of sixty-four cases. Besides, there were found various changes in the ovaries (cysts and corpus lutea), in the oviducts (salpinx), and now and then para- and peri-metritis, hypertrophia cervicis, different vaginal affections (cysts, cicatricial formation, catarrh, &c.). But all these affections were in small number, and, as it appears generally, of a secondary nature. These *post mortems* showed also the relative frequency of complaints

of the uterus; whilst we must recollect that a mass of these cases, if chronic in their course, are only of a slight nature, and only cause superficial inflammatory processes which completely disappear, without leaving behind changes in the respective tissues. A greater portion shows itself only in redness and swelling of the mucosa, as well as in hypersecretion, sometimes without further change of the nature of the secretion. All these changes can only be properly recognized in the living animal, and are only indifferently or not at all seen *post mortem*. Therefore all these cases up to a certain point during œstrum very often cause sterility.

By careful examination of the genital organs of non-pregnant cows with irregularly occurring œstrum it is possible in most cases to recognize different ailments which have their situation in the uterus, cervix, portio, vagina, ovaries, oviducts, or in the neighbouring parts, now occurring in the one, and now in the other, of the known organs.

By rectal examination one will then find the uterus variedly enlarged, the walls are more or less thick, hard, or firm; sometimes œdematous or knotty. Frequently, also, one finds in the uterus greater or smaller collections. In pyometritis, occurring not seldom, the uterus is always greatly enlarged, stretching far into the abdomen, and fluctuation can always be plainly felt. In the majority of cows with irregular œstrum, one cannot detect any contents in the uterus, but generally a thickening of the organ with noticeable asymmetry of the cornua, which then projects downwards rather deeply into the abdomen; yet the horns can be also short, thick, and, at times, rolled together. On touching the horns, one can trace plain contractions.

In inspectio vaginæ by fixation of the cervix and retracting the same with forceps or hooks, it will be found that in most cases the cervix is the site of considerable affections, causing more or less swelling of the portio vaginalis, and of the mucosa of the cervical canal throughout its whole length. The portio, on account of this, changes considerably in form. The cervical canal deviates much from the normal, not only in length and width, but also in situation and disposition of the external and internal orifice. Often the changes extend into the deeper layers of the tissue, so that the cervix becomes thicker and longer. During periods of œstrum the tendency of the cervix to enlarge is then considerably limited, or completely arrested. The vaginal portion can be more or less swollen and the swelling scarcely noticeable, or as big in circumference as two doubled fists. It is frequently irregular in form; the surface often appears forked, fringed, or much lobed, or its whole length may be swollen in

radiating folds. The surface will, in the latter case, be formed by a number of finger-thick ridges, which radiate or collect in the centrum. In some cases these folds are not very pronounced, are slightly obliterated, and form a kind of trimming round about the mucosa, which is greatly swollen and projecting out of the cervical canal, making an irregularly formed wall surrounding the wide opened orifice of the womb.

In other cases the folds were not very pronounced and almost of normal colour, but within the fringe one could see the mucosa of the cervical canal projecting and presenting a smaller or larger swelling of deep red colour, very sharply defined from the surrounding pale red mucosa; besides, it was damp and slimy in appearance and covered the orificium extern. completely.

Not infrequently one meets with other abnormalities of the vaginal portio such as rents which extend more or less anteriorly, connective-tissue bridges of different thickness, as thick as one's finger, or as broad structures which extend from above to below and cover the orificium extern. completely.

The cervical canal shows great differences in width, in the condition of its mucosa as well as of the orificia extern. et intern. As a rule, one finds the orificium extern. in the middle of the portio; in the frequently occurring changes of form the orifice alters its position, and may be one-sided, up or down.

The cervical canal in the majority of cows with irregular pregnancy is open and so wide that in many cases it can be penetrated with a large Bozeman's catheter.

The mucosa is almost always the situation of inflammation, and is then swollen, strongly injected, and hypersecreting. In the cervical canal one always finds a secretion varying much in amount and consistence. Generally, it is copious and muco-purulent, and may be more of the one or of the other; often it is mixed with flocculi and lumps. Not seldom in nymphomaniacal cows the secretion is plainly limited to the cervix, whereby the mucosa of the canal and portio is covered with a tenacious, smeary secretion of yellowish-white colour. The canal is now and then filled with a thick, very tenacious slime, and this mucus projects from the external orifice like a plug.

By careful examination in the great number of unfruitful cows an affection of the uterus can be established, which in most cases is connected with endometritis catarrhalis and more seldom with metritis.

The causes of this complaint are:—

(1) More or less septic acutely running inflammations of the uterus whose ending is the chronic form.

(2) Benign chronic and slowly advancing processes at the beginning which pass away without injuring the general condition, and without noteworthy discharge from the external parts of the genitals. Anamnesis of unfruitful cows and rectal and vaginal examinations have convinced me that most cases of endometritis date from the last calving. During or immediately after calving one finds an infection in the genitalia; inflammatory processes of different degree and condition then form, predisposing the genitalia more or less to wounds or injuries; also the mass and virulence of the infectious material visibly influence the course of the inflammatory processes.

If we examine the visible septic inflammations of the uterus with copious secretion we shall agree on their frequency and etiology. We know that more or less harmful infections are caused in consequence of difficult parturition, torsio uteri, or retentio secundin. This latter calamity is a most frequent source of infection of the uterus with subsequent sterility.

In this connection we need only notice the relation between infectious abortion and sterility. Most cases of abortion, perhaps with the exception of those in the first months of pregnancy, are caused by the bacillus of abortion discovered by Bang. This bacillus is introduced into the system partly through covering and partly as we know through the food.

In most cases of abortion great inconvenience is caused and the cow is very hard to get pregnant again. Unfortunately with us there are not many yards where abortion does not become stationary. The most evil accompaniment of abortion—the resulting sterility—is plainly due to secondary uterine infection, and this depends on whether the placenta goes away spontaneously or not; in the latter case the method of treatment introduced is of importance.

Also in normal parturition retention of the after-birth is a frequent sequel which causes much harm, which by systematic examination of the stock on many and large holdings can be proved. But uterine infections may occur in normal calving and regular ejection of the placenta, as may be frequently seen where there is often copious and chronic discharge. As a rule, they are then benign affections without general disturbance. Most of these disappear without being noticed because the discharge after calving is not abnormal either in quantity or consistence, and because it soon ceases. Not infrequently a

pronounced inflammation may be present, co-existent with a great enlargement of the uterus, and often with a palpable collection in this organ. These complaints are generally announced by abnormal expression of heat and aconception.

By examination of the genital organs systematically and early we find a great number of animals very hard to get pregnant, and in which metritis is prevalent. We agree with Kitt that this kind of anomaly in animals which have never borne young is seldom found. Most endometrites are a direct result of an abnormal parturition, as the opportunity for infections of many different kinds is at this time a very favourable one. On farms where parturition of cows is very irregular little or no difficulty occurs with the heifers; but where these have calved or aborted the trouble arrives.

How, then, does chronic endometritis cause sterility? In different individuals there is no doubt an essential difference of sterile-making moments which in most cases may be sought in one or several of the following conditions:—

(1) Stenosis either in the cervix, horns, or oviducts, but most frequently in the first-named. The individual causes of stenosis are either changes of form of the portio vaginal, strictures of the cervical canal, or strictures of both orifices. Further swelling of the mucosa inside the whole uterus together with secretion of increased or changed mucus.

(2) Changes of the uterine mucosa transient or continuous which hinder the implantatio ovi and cause abortion in quite an early stage of pregnancy.

(3) Secondary ovarian affections through encroaching inflammatory processes, or through reflectory ways by which normal ovulation is hindered or destroyed, whilst a cystic degeneration of the Graafian follicles together with a faulty atrophy of the corpus luteum arises.

Concerning stenosis, there is no doubt whatever that this causes sterility in the cow. The uterus of the cow and the narrow ring of the cervix are so formed that no great changes are necessary in order to render a segment of it impassable. So the covering act of the bull is quickly performed; the spermatic fluid is proportionately small, since it is necessary that the sperm be deposited in a definite place—namely, in the external orifice of the womb.

The changes which one encounters so frequently in the cervix of unfruitful cows cause, as a rule, such great deviations from the normal condition that the passage of spermatozoa through the cervical canal is difficult or quite impossible. That a uterine mucosa covered with

slime, pus, or membranes whose glandular apparatus is wholly or partially destroyed, is not in a position to bring about internal union with the ovum is quite self-evident. The natural result, then, is early abortion.

Cystic degeneration of the ovaries I consider to be a secondary complaint, caused and maintained by uterine affections. The proof of this, I hold, is established by these facts:—

(1) Endometritis is found existing at the same time as the cyst.

(2) The endometritis is primary, and the cyst secondary.

(3) The cystic formation disappears or ceases as soon as one treats the endometritis. In regular examination of new milking cows about a month after calving I have always found, accompanying the cyst in the ovaries, a quite pronounced enlargement of the uterus, often also a small collection of fluid in the same; in all cases of cystic ovaries I found the cervix the seat of an inflammation accompanied by not inconsiderable secretion.

Since the occurrence of cysts in the greater number of nymphomaniacal cows can be traced back to a month after the lost calving, anamnesis, and especially rectal examination, shows clearly that the uterine disease is primary and the cyst secondary. So it happens that cyst formation ceases with a regularly carried out treatment of the uterus, and bellowing, nymphomanic cows are almost extinct from those standings which went in for proper treatment.

Even old cases of nymphomania have been completely cured, as the following shows that in 1906-07, of twenty-three regularly-treated holdings, with about 2,000 cows, ten bellowers were not cured; and in 1997-08, of fifty-three properly treated homesteads, with about 3,100 cows, nine bellowers remained uncured. Of old cases of nymphomania I have treated in the last two years 141 head, of which 117 have been cured.

I neglect the corpus luteum persistentiæ, and undertake no squeezing of it out, as it is quite superfluous. After treatment of the uterus œstrum occurs regularly in the course of the first three weeks.

Infectious forms of vaginitis play a proportionately small *rôle* as causes of sterility in the cow; acute vaginitis, with severe symptoms, is rather easy to cure, and seldom causes sterility. Chronic vaginitis follicularis is a very harmless affection, which bears no casual relation to co-existent sterility.

Treatment must be quick and comprehensive. Doubtfully pregnant cows must undergo rectal examination, and pregnant animals be separated from non-pregnant. The latter are then treated according

as they suffer. Treatment is dependent on a fresh and early diagnosis of pregnancy.

How early can one, then, diagnose pregnancy? Pregnancy can, in most cases, be certainly diagnosed when the fœtus is six weeks old, in some cases earlier, and in others later. The signs of pregnancy are as follows: An asymmetrical bulging out of the uterus, whereby the pregnant horn becomes a little larger than its fellow. The walls become soft and quite thin, and plain fluctuation occurs at a definite place. The cervical canal is generally firmly closed. The non-pregnant animals are put under suitable treatment, according to the situation and nature of the complaint.

Since chronic endometritis, as well as real metritis, arises from uterine infection occurring immediately after calving, so uterine affections in the cow demand careful treatment at this period.

It must be our aim to hinder infections if possible, and, if such have occurred, to bring the subsequent inflammation of the uterus to a conclusion as quickly as possible.

It is an undoubted fact that retention of the after-birth is one of the most frequent causes of infection. A rational treatment of this evil is therefore of great importance. As is known, very divergent opinions prevail as to which is the best method of treatment in these cases. I have taken away thousands of envelopes, and I am now completely convinced that only by right-timed (opportune) taking away of the secundinæ can normal conditions be most certainly and expeditiously restored.

If infection by extension or other causes has occurred in the uterus, with resulting inflammation, this must be energetically combated, which is best accomplished by removal of the collected secretion and purifying and disinfecting injections. To accomplish this work satisfactorily has hitherto been very difficult, since only with great trouble, or not at all, was the practitioner in a position to introduce instruments through the bowed, narrow, and beset-with-folds cervical canal. This difficulty chiefly arose through the unsuitability of the instruments and the unrest of the animal. The treatment was very faulty on that account, probably resolving itself into irrigations of meaningless strong solutions of sublimate, carbolic acid, creolin, or lysol; whilst an effective distension of the uterus was either quite unobtainable or only faultily performed. But even very strong solutions cannot effect removal of the uterine secretion, and, indeed, through stagnation they may become injurious.

The chief weight must be put on complete emptying of the uterine

secretion. The latter is best accomplished as follows: I place in position a vaginal dilator of my own design, and by means of a double-hooked retractor inserted into the interior of the canal of the cervix uteri I draw the latter as far back into the vagina as possible. To get a firmer hold I apply a pair of Museux's forceps to the cervix. I may remark that the animals submit to the operation I have described without showing any evidence of pain, and only resist slightly when the hand is introduced into the vagina; the animal being held during the operation by two or three men. It is then possible to introduce a wide, flexible india-rubber tube furnished with sharp edges. By means of different catheters, and with the help of a mandarin, it is then possible to easily remove a secretion from the uterus, however much it be hardened or organized. Lugol's solution has given me the best results in chronic endometritis. If the portio is greatly deformed I remove the diseased tissue with knife and scissors. If the mucosa of the cervical canal is swollen and very much inflamed, it is cleansed with tampons soaked in spirit, and afterwards pencilled. With my method I have cured 90 per cent. of sterile cows, and restored normal conditions in herds where 60 per cent. were diseased.—G. M.

Received B. A. I.

GASTRO-ENTERITIS IN CATTLE; MALIGNANT CATARRHAL FEVER.[1]

By Dr. A. THEILER, C.M.G.

Government Veterinary Bacteriologist for the Transvaal.

Under the first name in British East Africa, and under the second in German East Africa, a disease is described of which I must confess that, although the names suggested nothing new in any way, yet quite a new disease is meant, which was not before known in literature. We may define it shortly as a contagious disease, resembling somewhat rinderpest. Since its contagion is beyond doubt, and it has in British East Africa already been spreading over a considerable area, it may become more than simply interesting for a South African veterinary surgeon.

In German East Africa the disease was first noted in Mpapua in 1906, in a herd originating from Ugogo; the following year it was seen in Kilimatinde, in Moschu, in Usambara, in Uhehe, and Tabora. Natives did not know the disease, a sure sign that it must have been

[1] *Transvaal Agricultural Journal.*

of recent introduction in those places. In British East Africa it first came under notice in a mob of cattle which were brought from Kisumu by Somali traders. Since that time it has been found on several places, and was the cause of considerable mortality amongst the young stock in the Northern Masai Reserve. The natives of Kisü and the Wa-Kavirondo did not know the disease, and the Masai mistook it at first for rinderpest. All breeds and all ages, as well as both sexes, are susceptible; the greatest mortality is, however, noticed amongst the young stock and in animals of bad condition, whereas in many herds full-grown animals did not show any signs of illness.

Symptoms.—These may be developed in a more or less pronounced degree; we might distinguish them as general and specific ones of the head, the intestinal tract, and the skin. The disease may have an acute or sub-acute course. General symptoms: The first one is the fever, which, in acute cases, may run as high as 105° F., whilst in subacute cases, where an emaciated condition becomes pronounced, it may be low or even entirely absent. The animal shows distinct illness, staring coat, loss of appetite and rumination, drooping ears; loss of condition sets in, and emaciation may finally follow. Death in acute cases is said to occur within three to five days; the sub-acute form may linger on for about three weeks. Specific symptoms: There is a watery discharge from the eyes and the nose. After a day or two the discharge become mucous, but quite exceptionally muco-purulent. It is this symptom which reminds one of rinderpest at first sight. There may be an increased salivation, saliva dropping from the mouth, sticking around the lips, and giving it a dirty appearance; the animal grinds its teeth, and on opening the mouth an offensive odour may be met. The examination of the mucous membranes of the mouth may show a bran-like deposit on the gums, which can be easily removed, exposing pale pink exfoliations; in a number of cases there is ulceration under the incisor teeth. These are sometimes round and discrete, at other times confluent; ulcers of the buccal and lingual membranes are reported to have been seen. The bowels at first are constipated, the fæces being passed in small hard lumps. In the course of two or three days a thin watery diarrhœa sets in; it is seldom mixed with mucous or blood; it does not excoriate the skin of the hindquarters, and abdominal pains are absent. Although the diarrhœa is persistent, it is not accompanied with straining, the liquid fæces running from the animal without even elevation of the tail. The skin may become the seat of an eczema,

appearing rough and scurfy, the hairs sticking together in small clusters. This may be so pronounced that it can be noted at some distance.

Pathological Anatomy.—The following *post-mortem* report was made on August 4, 1909, at 11 a.m., on a cow, aged about 4½, which had died early in the morning. Condition rather poor, eyes sunk, slight superficial erosions of upper gums, mucous of vagina pale; rigor not complete; skin eruption all over the body, but especially pronounced on the shoulder and neck; blood well coagulated; there was a slight reddening of the papillæ of the first stomach; the membranes of the second and third stomachs were normal; contents soft; fourth stomach contained liquid; mucosa uniformly deep reddened and even black, with the folds swollen. The duodenum was covered with a yellow deposit, having the consistence of cream cheese; it could be easily removed, leaving a superficial erosion of the mucosa, which was reddened and swollen. A similar condition was found all through the jejunum, the deposit being in patches and of distinct croupous character. The ileum was diffusely congested; black zebra markings were present. The yellow croupous deposits were distinctly adherent to the Peyer's patches, in the shape of elongated, continuous, or isolated plaques. The croupous membranes sloughed off easily, leaving superficial erosions. The mucosa of the colon was uniformly swollen, strongly congested, and throughout its surface covered with a continuous yellow croupous membrane. Similar conditions were found in the cæcum and rectum. The liver was congested, rather dark in colour, and friable. The gall-bladder contained thick yellow bile, with flakes of croupous membranes. The walls were thickened, the blood-vessels injected and the mucosa reddened and covered with the yellow croupous deposit. The spleen was normal, and so were all the lymphatic glands. The kidneys were somewhat congested and œdematous on section. The urine was normal and so was the vagina. The lungs showed an interstital emphysema; the heart was in diastole, filled with coagulated blood. There were a few petechiæ on the epicardium, none on the endocardium.

The above represents an acute case. In a subacute case which came to my notice, the croupous membranes were absent, and the inflammatory symptoms were but slightly pronounced. It seems to be the rule that the lesions of a simple gastro-enteritis and anæmia are the most prevalent on *post mortem*, and again anæmia alone may be noted.

Cause of the Disease.—The history indicated that this disease is of a contagious nature, and the symptoms described both in the living and the dead animal are strongly suggestive of rinderpest. To this comes the fact that it is observed in a country where rinderpest occasionally threatens to be introduced from Abyssinia, and indeed the Masai, who had some previous experience, promptly identified it with rinderpest.

The theory, therefore that it was rinderpest in a mild form, either attacking animals with inherited immunity from parents who had gone through a previous attack or a modified and attenuated contagion, had some support. From experimental facts rinderpest had to be excluded. Already Lichtenheld, with the blood of a sick animal, had inoculated quite a number of healthy ones, without producing the disease. Stordy, too, only obtained negative results. At my request Stordy repeated the experiments again with the blood of the animals on which we had made *post-mortem* examinations taken during life, and at the same time some control calves were placed in immediate contact. The result was that none of the injected animals took the disease, but the contact-control animals developed a fever after an incubation time of five days. This settled the point of the non-identity of the two, rinderpest being inoculable with blood. It is further noteworthy to state that the microscopical examination of the blood did not reveal the presence of any specific micro-organisms.

Although the mortality caused by this disease is nothing compared to that caused by rinderpest, it might perhaps be more serious to our cattle-breeders than rinderpest itself, because the latter disease can be effectively dealt with, whereas nothing could be done as yet against the new one. It is therefore advisable to be on the look-out and guard against its introduction.

CLOTHING AND CLIPPING HORSES.[1]

By General F. SMITH, D.S.O.

All lay writers on stable management have urged the necessity for hot or warm stables for horses; all veterinary writers have condemned the practice. Those who urge the system at the present day may be interested to know that it had its origin in the question of the amount of hair grown during the winter, at a time when clipping was unknown. Very little observation was sufficient to show that

[1] From the Annual Report of the Director-General, Army Veterinary Service.

the horse kept in the hot stable grew a far shorter coat than the animal in the cold stable, and this fact was the basis of a practice which was also incidentally found to favour the putting on of fat, and the production of a gloss on the coat.

Clipping was unknown or unpractised in this country until the early part of the nineteenth century. No reference is made to it in any of the old works on the care of horses which I have consulted.

Sir Francis Head, writing in 1860,[1] tells us clipping was imported into England during the Peninsula War. It was observed that the Spanish muleteers gave to the animals they had charge of great apparent relief by rudely shearing off the hair that covered their bodies, and on the idea being imported into England, our hunting men, principally at Melton, commenced the practice by clipping their hunters, at a cost, at first, of about five guineas. After the clipping process, which occupied four or five days, the horses were shaved, but this was attended by certain disadvantages, and the routine practice was to clip and keep the coat short by repeated singeing.

Such is the early history of a process which is now established as an essential feature in horse management.

Thirty years ago no one thought of clothing the body of the troop horse, but since the general introduction of clipping in the Service, there has been a very natural desire to replace in the form of a blanket that which has been lost by clipping. Many important changes have small, some even microscopic beginnings. When clipping was first introduced, it was limited to the belly and legs; it gradually crept up the body, and trace high became an established standard. It then began to find its way up the front of the neck, while bolder horse-masters took the hair off everywhere but on the back and loins, and in course of time even this disappeared. The evolution of the troop horse into the clipped hunter has taken many years, and on the whole, so far as limited clipping is concerned, the horse is the better for it. With the extension in the practice of clipping came the demand for blankets, a perfectly logical sequence, but representing extra cost in the maintenance of the horse, and therefore a subject for difference of opinion. At the present moment the necessity for clothing troop horses is one of the most prominent matters in horse management, and for this reason it is, perhaps, desirable to go into the question of cold and exposure more fully than would otherwise have been necessary.

[1] "The Horse and his Rider."

The natural attitude taken up by the majority of people is that the horse must feel cold in winter, and that clothing is the remedy; while if the coat be removed by clipping, clothing is considered an absolute necessity.

The case as stated appears to admit of no argument, and it bears the imprint of common sense. On reflection, however, it is difficult to reconcile the necessity for clothing in stables with the well-known fact that the horse was born in the open and has lived there for the first three winters of his life without clothing. This is met by saying that under these conditions the animal was not clipped, and that the necessity for clipping alters the matter. There is reason for thinking that this view is incorrect, and we must, therefore, consider the question under two heads—viz., is clothing required by unclipped horses? Is it essential for those which are clipped?

Clothing for Unclipped Horses.—Most half-bred horses are foaled during the late winter or early spring. For eleven months the foal has been living at a temperature of not less than 101° F., but in the course of a few minutes (normal foaling is very rapid in the mare) the young animal finds itself projected into the world, and deposited on the cold or wet ground, the surrounding air temperature being near or even below freezing point. This sudden change in temperature does no harm, and the foal in a very short time is on its feet.

But the physiologist knows that profound changes have in the meantime been taking place in the young animal's body, that whereas previously no effort was required to maintain its heat, it now has to produce heat and to regulate the amount. Heat production and regulation are matters under the control of a distinct part of the nervous system. Immediately the young animal is born the process comes into operation,[1] and by its means the temperature of the body is maintained and regulated.

The body requires less heat in the summer and more in the winter; this is automatically regulated by the nervous system, the fuel being the food, the furnace the muscles, the nervous system the stoker. Examples of this law of production and regulation are numerous. Man can live on the Equator or over the Pole, the body heat remaining practically constant. And the same applies to horses. Jackson[2] has proved that these may live at 80° N. latitude for two and a half years, and not even on the ordinary diet to which horses

[1] Not so in all animals; there are many which at first are incapable of maintaining their own body heat, and need that of the mother; for example, kittens and puppies.

[2] "A Thousand Days in the Arctic," by F. G. Jackson.

are accustomed. This explorer's observations on equines in high latitudes are of the greatest interest, and his experiences will be again referred to.

Exposure to a low temperature renders the body very sensitive to a rise in the thermometer. Heat may be complained of in the snow house of the Esquimaux, in which the temperature does not rise above freezing point; and Jackson tells us that when the thermometer in July stood at its maximum, 8° above freezing point, it felt like mid-summer, and was far too warm. To appreciate this fact, we have to remember his observations showed that in three years the thermometer never rose higher than 11° above freezing, while 70° to 80° below freezing, in a wind-stricken country, were quite common. Conversely, living in a high temperature renders the body more sensitive to a fall in the thermometer.

Quite apart from one's general knowledge, the facts mentioned above may be readily demonstrated by passing the hand from hot to cold water and *vice versa*. The cold water feels colder than it really is in passing from hot to cold, and the hot water seems hotter than it really is in passing from cold to hot. Applying this fact to daily life, it accounts for the feeling of cold in passing from a warm room in winter into the open air, and for the feeling of heat on passing from cold air into a warm room.

If a part be persistently protected against the air it becomes very sensitive to exposure; if it be habitually exposed a considerable degree of cold or of heat can be borne with impunity. A good example is afforded by our own hands and face; it takes quite a relatively low temperature to cause the hands to feel cold, while little less than an arctic winter produces a feeling of cold in the face, and this in spite of the fact that the large majority of men keep it hairless.

This fact relating to the influence of exposure explains the indifference of children to short and low dresses, bare legs, and the absence of socks or shoes. It explains why women, who at all times wear far less and lighter clothing than men, enjoy immunity to exposure in evening dress. It explains why the street arabs in the cities of the north can go about bare-footed and bare-legged on stone pavements in the coldest weather. Primitive man wore nothing more than his progenitor wears to-day. Few facts in his travels impressed Darwin[1] so deeply as the exposure the inhabitants of Tierra

[1] "Voyages of the *Adventure* and *Beagle*."

del Fuego withstood in a naked condition, living in one of the coldest and most tempestuous climates in the world outside the Arctic circle. In some parts the only clothing worn was a small patch of skin the size of a pocket handkerchief fastened around the body by a string, the position of the patch being altered to meet the blast; many wore nothing whatever. The newly born were exposed like their parents, and the women at all seasons spent part of their time in the sea gathering food. The people did not die from cold; through long ages their nervous system had learned to regulate the heat supply, while exposure had conferred immunity. In a small way the fact is evident among ourselves; a man is not ordinarily conscious of baldness, or the exposure resulting therefrom, because the process is gradual. He cannot tell by any subjective feeling where the baldness ends and the hair begins. It is evident the skin of the scalp has contracted a comparative immunity to the sensation of cold. Turning once more to the naked savage, it is not until attempts to civilize them, by employing clothing and living under shelter, that lung trouble appears. Clothing and shelter weaken their resistance, and this has been proved true of all savage races brought under the destructive influences of civilization.

These examples have been chosen from man as they more directly appeal to general knowledge and observation, but there is no necessity to confine our observations to mankind; there are thousands of valuable stock which spend their life outside. Who troubles about the Highland and Shetland ponies spending their winter in the open? On hearing that a horse is being turned out for the winter, whoever thinks of asking whether the animal will receive clothing as a protection? The London cab-horse, clipped trace high, spends ten hours a day in the streets in all weathers; he wears no rug in the open, though occasionally one may be thrown over his loins. Finally, the thorough-bred brood mares of this country, and their stock, together worth hundreds of thousands of pounds, live in the open the whole year round without clothing.

It is not generally known that when horses are turned out it is seldom, unless they are ill, that they take advantage of any shelter provided. Rain will drive them under cover—there are few things they dislike more—but cold they apparently enjoy; on a bright frosty night they may be seen outside instead of under shelter, and even lying on the snow.

It is unnecessary to press this matter further. It cannot be doubted that the unclipped horse can live in the open without clothing,

but if he is to work and maintain his condition he must be fed. Jackson's ponies lived in the open during sledging expeditions, they wore one blanket, and were exposed to an almost constant blizzard with a thermometer 45° F. *below zero*, at night. It is difficult to imagine the intensity of this cold until we remember that it was as far below freezing point as summer heat is above.

Clothing for Clipped Horses.—The next point to consider is how far clipping destroys a horse's power of resisting cold. A horse clipped on a cold day very soon begins to shiver, arches his back, and his coat stares. He feels cold, and the heat-producing agencies (the muscles) by their rapid contractions (shivering) are producing more heat to meet the demand. There is nothing alarming in this shivering; the same will occur during the winter after a drink of cold water, and from the same cause. Still, it is a wise measure of precaution for a blanket to be worn for a day or two after clipping until heat regulation is established under the new conditions. This restoration is very soon effected; we can follow the process in ourselves after hair cutting on a cold day, or the removal of a beard. The loss of hair is distinctly felt, and may be evident up to the second day, but not later. This is a very close parallel to what occurs in the horse; a day or two after the removal of the coat the loss is no longer felt, and such animals may be exposed with as great impunity as an unclipped horse provided they are fed. The importance of this statement is considerable; its accuracy is based on probably not less than 3,000 observations, and is undoubted.

Neither coughs nor colds need be expected to follow this Spartan system; they will be quite unknown. Captain F. G. Jackson, to whose work I have previously referred, has courteously informed me that his ponies never had a cough or cold. Towards the end of his explorations the last pony died, the only one the death of which could be attributed to exposure, but the temperature froze mercury, and the animal's daily diet consisted of two or three dog's biscuits, a few dried vegetables, and bear's meat. Horses living in the open and performing hard work, especially if the thermometer be low, require to be well fed. Given that, they can be exposed with impunity.

Writing in 1816, Lawrence tells us[1] that in his day there were no horses in such hard condition as those running in mail coaches. He comments on the fact that these horses wore no clothing, and stood in stables with both doors and windows open; they were exposed to a life

[1] "The Complete Farrier and British Sportsman."

of hardship, bad weather, and severe work, such as no animal at the present day has to contend with.

In practice there does not appear to be any necessity for the hair to be removed by clipping from the entire surface of the body. Clipping trace high (leaving the hair on the legs) is ample to prevent sweating; modifications may be practised by clipping all but the back and loins.

The necessity of leaving the hair on the legs is urged by some, not only for protection against thorns, as popularly and erroneously supposed with a hunter, but also on account of the additional warmth. The skin of the legs has no sweat glands, so the legs do not sweat: whatever is seen there has run from above, and in advocating the hair being left on the legs, the fact of this skin not sweating is taken into account. In theory there is no necessity to clip parts which do not sweat, but in practice fashion and appearance take the place of utility.

If it be admitted that loss of heat occurs when clipping is followed by no blankets, and that this loss can to an extent be avoided by using them, the question naturally suggests itself, why not employ blankets?

The disadvantages of blankets in stables may be summarized as follows:—

(1) If one blanket is used in the stable, two will be required in the open.

(2) It is impossible to give two blankets to every horse on service owing to the increase in transport; they will at first have one, and as the difficulties in transport increase they will disappear.

(3) Blankets naturally favour the spread of skin disease, and on this ground alone their use should be interdicted in war, where mange is one of the first diseases to appear.

(4) Horses that wear no blankets are less susceptible to cold, harder, better fitted to stand exposure in the open, but they must be well fed and cared for.

(5) Blankets lead to "coddling." Units may be seen exercising their horses in blankets, draught horses on fatigue may even be seen wearing the harness over the blanket. The necessity for blankets has generally become so profoundly impressed, that there are commanding officers afraid to allow a troop horse to stand in the open, even for a few minutes, without a blanket being thrown over him, yet this animal may be required for war to-morrow!

The advantages of blankets are:—

(1) A smaller ration is required.

(2) The horse is kept cleaner and is therefore less trouble to groom.

(3) The coat wears a brighter look.

(4) The horse looks more comfortable.

All these points are conceded, but they are not of that nature to prove blankets a necessity. Facts are sometimes difficult things to explain, yet the fact remains that no one has yet seen a well-fed and cared for horse die from exposure to cold. We grant the additional comfort furnished by a blanket; but comforts are doubtful advantages, while actual necessities are few. The blanket-wearing horse has the whole of the belly and thighs exposed, but this is always forgotten, as the parts are out of sight, yet the exposed area is considerable, and judging from our own sensations the feeling of cold should be considerable. We know, however, that it is not so, and that the horse cheerfully lies on the cold and wet ground without contracting any chill through his exposed belly.

The "coat" of the blanket-wearing horse, no doubt, looks brighter, and possesses a sheen denied the other, but this is a mere question of appearance. There is a great difference in the appearance of the hair of a person wearing no hat from one who keeps the head covered; but the hatless man is immune to exposure, an asset of no little value.

Fortunately there are a few commanding officers who set their face against the use of blankets and depend on good stable management. In two of the most exposed military stations in the kingdom, Newcastle-on-Tyne and Shorncliffe, we have known animals without clothing the whole year, and no horses could look better.

Delayed B. A. V.

ANTHRAX.[1]

ANTHRAX is a contagious disease caused by the *Bacillus anthracis* Human beings and all animals are liable to become infected. The disease, which shows itself suddenly, chiefly attacks cattle, pigs, and sheep, but horses are not uncommonly affected. It is very quickly fatal, usually within forty-eight hours, but in the United Kingdom it does not often spread with rapidity from animal to animal, though it may affect a number of swine at the same time time if they have been fed on flesh affected with anthrax.

Symptoms.—A beast, which a short time before appeared to be well, may be found dead, or in a dying condition, frequently with blood oozing from the nostrils and anus. In cattle there are no typical symptoms, but in horses and pigs the region of the throat is often found to be swollen.

Post-mortem Appearances of the Disease.—The carcase is swollen.

[1] A leaflet issued by the Board of Agriculture and Fisheries.

Blood is often found around the nostrils and anus. The muscles may be infiltrated with blood at certain points. The lungs and glands are congested. The spleen is very much enlarged; it is softer and darker than normal, and its substance usually resembles tar.

In most parts of this country the enlargement of the spleen in cattle is of great diagnostic importance, but in those districts where redwater exists, enlargement of the spleen may be due to this disease and not to anthrax. In such a case, however, the spleen substance has not the same fluid tarry appearance. In horses and pigs, and much less frequently in cattle, the spleen may be of normal size, although the animal has died of anthrax. The flesh is dangerous to animals and human beings.

Difficulty of recognizing the Disease.—One of the greatest of the difficulties which present themselves in dealing with this disease is that the symptoms during life are not such as to lead a person who is unacquainted with anthrax to suspect the presence of the disease. Moreover, the death of the animal attacked often occurs when the owner or attendant is absent. It frequently happens that an animal which has sickened is killed, or that the carcase of an animal dead of anthrax is cut up, and the blood, which is the main source of danger, is freely spilt about the premises or on the soil. The disease is in this indirect manner spread to other animals, and in some cases the persons who have handled the carcase contract it. In every case of sudden and unaccountable death amongst stock the owner of the animal should await a skilled opinion before disposing of the carcase.

Anthrax or Suspected Anthrax to be Reported.—Every person in Great Britain having or having had in his possession or under his charge an animal (that is, a ruminating animal, pig, horse, ass, or mule) affected with or suspected of anthrax is required by law to give notice of the fact with all practicable speed to the police. Failure to give such notice renders a person liable to a fine of £20, and in certain circumstances to a month's imprisonment with hard labour.

It is the duty of the Local Authority under the Diseases of Animals Act on receiving such notice to institute inquiries, and to make proper provision for the disposal of the case of any animal suspected of anthrax, and for the disinfection of the premises upon which disease has existed. The Inspector of the Local Authority is also required to give information to the Medical Officer of Health.

Precautions to be taken pending Inquiry.—Pending inquiry the owner can do much to assist in preventing the spread of the disease amongst his stock, and it is clearly to his own interest that he should do so.

The sick animal should on no account be killed, but should be carefully isolated from all other animals. Should it die before the arrival of the veterinary inspector the carcase must not be dragged along the ground, but should be allowed to remain where it is, until the examination has taken place. It is essential that the carcase of the animal should not be cut or opened, and steps should be taken to prevent the escape of blood or of excretions which may contain blood. Precautions should also be adopted to prevent the possibility of any person or animal obtaining access to the carcase, or to any blood which may have exuded therefrom. As an additional precaution quick-lime may be freely spread on the floor or on the ground surrounding the carcase. Animals with which the suspected animal has been in association should be carefully watched, and isolation at once adopted in the case of the appearance of symptoms similar to those of the suspected animal. Such precautions are particularly necessary in the case of milch cows affected or suspected of being affected. The milk of these cows may contain anthrax bacilli, and so be the means of infecting human beings.

Procedure of the Local Authority.—Local Authorities are required by Article 3 of the Anthrax Order of 1899 to obtain the assistance and advice of a veterinary inspector in all instances in which anthrax is reported to them. Although the clinical symptoms may in many instances justify a veterinary inspector in forming the opinion that anthrax exists, it is desirable that his diagnosis should be supported by the positive evidence of a microscopical examination of the blood of the suspected animal. Such examination, if the specimen be obtained soon after death, is by no means difficult. The specimens should be taken in duplicate and carefully preserved for future reference.

Investigations as to the origin of the outbreak should include careful inquiries as to the use, for or about the animals, of manufactured feeding stuffs, or bone and other artificial manures, as such substances are known in some cases to have been the media by which the disease has been introduced. The possibility of infection being conveyed by the water which the animals drink should not be overlooked.

It is very advisable that the owner of all cattle, sheep, or swine which have been in association with the diseased or suspected animal, and are pronounced by the veterinary inspector to be apparently healthy, should move them under the supervision of an officer of the Local Authority from the shed, or field, or place where the disease has originated, to some other place on the farm or premises where they can be isolated and kept under observation. The period of incubation of

anthrax is short, and seven days will, as a rule, suffice to enable the veterinary inspector to determine whether any of these animals have become infected or not.

Disposal of the Carcase.—Special attention should be given to the disposal of the carcase of an animal dead of anthrax. Cremation upon the spot where it died is, where possible, the safest method of disposal. Information on this subject has been issued to Local Authorities by the Board. If it is necessary that the carcase be moved to some convenient spot for the purpose of cremation, the nostrils and all the natural openings should be carefully plugged with hay or tow saturated with a strong solution of carbolic acid, in order to prevent the oozing of any blood therefrom. The dragging of the carcase along the ground is to be avoided. Where burial is resorted to the grave should be dug in some part of the farm, remote from any watercourse, to which animals cannot or do not ordinarily have access, such as a wood or enclosure. The method of burial is prescribed in the Anthrax Order.

The disinfection of the place or premises where a diseased animal has been detained or has died is then to be carried out in the most thorough manner of which circumstances admit. All manure, or broken fodder, remaining thereon should be disinfected or destroyed by fire.

General Observations.—It is important that it should be widely known that anthrax is due solely to the introduction of the bacilli or spores of anthrax into the blood of an animal or of man. The disease may therefore be introduced by any medium capable of conveying these germs or spores. Feeding stuffs brought on to a farm, or manures made from animal substances, may be vehicles of infection. If a stream becomes contaminated, as has been found to be the case where certain industries involving the use of the hides, hair, &c., of animals are carried on, the spores may be carried to the farm by the water. The spores of anthrax develop into bacilli which find their way into the circulation of an animal through a cut or abrasion.

Where infection has once been introduced upon a farm it has frequently been continued by the ignorance or carelessness of individuals, and in some cases farms have become permanently infected with anthrax.

It is a common practice amongst owners of stock to slaughter their cattle as soon as they present symptoms of serious illness, in order that the carcase and hide may be utilized. Where, as is not uncommonly the case, the sudden illness is due to the presence of anthrax, the greatest mischief is done by such a practice. The

blood of the diseased animal is distributed on the ground, or it may be on the floors of the cattle shed or upon the mangers, or is carried on the boots of the attendants to other parts of the farm or premises. The bacilli contained within the blood of a diseased animal will, when exposed to the air, multiply and produce spores which may become the means of infecting other animals at short or long intervals. Many cases have come under the notice of the Board from time to time of persons having contracted anthrax whilst engaged in slaughtering animals, or in dressing or otherwise handling the carcases of animals. During 1908, in addition to forty-seven cases of anthrax (of which seven were fatal) in factories and workshops, there were twenty-two cases (two fatal) in other industries. Of these, ten occurred among butchers and slaughterers and five among farm labourers.

On the other hand, the bacilli anthrax die if kept within the intact carcase of an infected animal; no spores are formed; and experience has shown that, where the precautions recommended above have been scrupulously adhered to, the disease frequently ceases after the death of one animal on the farm.

Preventive Inoculation.—The Pasteur method of preventive inoculation has rendered great service in preserving stock on badly infected farms in various parts of the world. The method consists of injecting the animals with fixed doses of attenuated cultures of the *B. anthracis.* Two injections at intervals of twelve days are performed. For the first injection a very attenuated culture is used (first vaccine), and for the second one employs a less attenuated culture (second vaccine). The immunity is established about twelve to fifteen days after the second vaccine has been injected. In cattle it lasts about a year, and should be repeated after this period unless the ground has become purified. The great majority of cattle operated on show little more than a temporary indisposition with passing fever after the injection, which may be assumed to indicate a mild attack of anthrax. Occasionally, however, an inoculated animal may die of the disease as the result of the injection, and for this reason the animals while undergoing the process of immunization should be kept in a special paddock, or better still in sheds which can be disinfected in the event of an accident taking place. The operation should only be attempted by skilled persons, who will know the best way to prevent an accident, and guard against its consequences should it occur.

Since the operation is not altogether unattended by the possibility of loss, and since it incurs a certain amount of expense, one has to consider under what circumstances it will be worth while undertaking it. It will be obvious that on farms registering only one death

annually it will hardly be called for, and that it would be folly to adopt it on clean farms.

It results from observations on several millions of cattle in various parts of the world that accidents occur in about ·5 per cent. of the inoculated cattle taken all round, and that the operation may be expected to reduce the death-rate from anthrax on infected farms to about 1 per cent. or slightly under.

If a stockowner finds that his annual losses from anthrax amount to 2 per cent. he will possibly find it profitable to have recourse to preventive inoculation.

It should be understood, however, that since the number of animals dying of anthrax in one year will vary, and since the inoculation must be repeated annually, the estimation of annual losses must be based on two or three casualties.

A certain degree of temporary immunity can also be almost immediately conferred by injecting a dose of anthrax serum, and the injection produces no accidents. Where animals have been exposed to the risk of what might be called gross infection (for example when a carcase has been carelessly dealt with on a pasture) it is advisable to inject them immediately with serum, and remove them to another field.

Farmers invited to assist Public Authorities.—Stockowners are, therefore, earnestly invited to co-operate with the public authorities.

(*a*) By reporting every case of sudden and unexplained illness or death, especially amongst cattle, to the police;

(*b*) By isolating the ailing animal, or by protecting the carcase from persons or animals pending the arrival of the veterinary inspector;

(*c*) By giving every facility to the officers of the public authorities in carrying out the precautionary measures enjoyed by the Anthrax Order; and

(*d*) By affording such officers every assistance in their power in tracing the origin of the outbreak.

They are further strongly recommended to give positive orders to their servants that under no circumstances is an ailing beast to be killed by them, or its carcase opened, where the cause of sickness or death is unexplained.

The Board have prepared a short notice (A 375/A) dealing with the principal points above set out, suitable for posting up in byres or sheds. Copies can be obtained gratis and post free on application to the Board, 4, Whitehall Place, London, S.W.

Clinical Articles.

TWIST OF THE DOUBLE COLON.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

Subject.—A cart gelding, aged 7.

History.—Showed symptoms of abdominal pain at 4.30 a.m., and was given one of the usual colic draughts, consisting of chloral hyd. ʒi., ol. tereb. ʒij., ol. lini oiss. When attended at 10 a.m. the following symptoms were observed: Intermittent struggling, the fore-feet striking the wall of the box in a violent manner; animal frequently lay on his back, during which time the hind limbs crossed each other in a peculiar manner; when attempts were made to get him on his feet he sat on his haunches and remained in this position for some time.

Very slight tympanites, but the abdominal muscles were hard and tense; pulse very weak; expression of countenance anxious; visible mucous membranes injected. Bowels had acted once.

Diagnosis.—Probably volvulus.

Prognosis.—A fatal termination.

Treatment.—Continued doses of chloral hydrate. Death occurred at 4 p.m. same day.

Autopsy.—Same evening. The peritoneal cavity contained a large quantity of yellow-coloured serum. The cæcum did not make its usual appearance when the abdominal cavity was opened, and the colon seemed firmly bound down. After a search the cæcum was discovered out of its usual position, the apex being close to the diaphragm. This intestine was very anæmic, and was perfectly empty. On removal of the double colon its external aspect was dark in colour; its second and third divisions were found to have a double twist close to the supra-sternal and diaphragmatic flexures.

The colon throughout its entire extent showed acute enteritis, the mucous membrane was almost black in colour, and the ingesta blood-stained.

Remarks.—No rectal examination was made. Judging by the difficulty experienced in getting rid of the twist when the colon was laid on the ground at the autopsy, it is quite clear that any therapeutic measures for the relief of the condition could not be successful. I cannot account for the altered position of the cæcum,

its anæmic appearance, and the fact that it was perfectly empty. The slight degree of tympanitis present is also a matter for comment. The contents of the colon were perfectly soft in consistence.

The etiology of twists of the double colon is still a mystery.

A CASE OF SUPRA SCAPULA PARALYSIS.

By Captain G. P. KNOTT, A.V.C.

History.—The subject was a thoroughbred Australian mare, aged 5, which was at the time a partly trained polo pony. Whilst being led at exercise she fell, getting the off fore-leg into a large deep ant-bear hole, which caused her to fall violently on to the right shoulder. She rose immediately, and no injury was noticed until on being asked to move she did so in such a manner that it was thought she had sustained a fracture of the shoulder. The accident occurred on March 1, 1907. The mare was then placed in slings, and I saw her first two days later.

Symptoms.—These were typical. When the mare was walked in a straight line the shoulder, when weight was placed on the limb, was jerked away from the chest wall, and, in fact, looked as if only held in place by the skin. When the leg was carried forward abduction was caused. The absence of pain, heat, or crepitation immediately settled any question as to the possibility of fracture.

Treatment.—The mare was kept in slings for a few days longer, with the idea of accustoming her to being on three legs, while hot fomentations were continually applied to the shoulder. She was then placed in a loose box with sawdust bedding, and a course of massage with mild, stimulating liniments was carried out, twice daily for half an hour each time. This treatment was followed until May 10. But the supra and infra spinatus muscles became more wasted every day, and by this time had almost, to all appearance, vanished. The spine of the scapula was so prominent as to be distinguishable some distance from the mare; and the shoulder felt, on each side of the spine, as if the scapula was only covered by the skin. From this date slight improvement seemed to take place, and a gradual reappearance of the muscles could be appreciated. The massage was now discontinued and the shoulder blistered.

May 25. The mare was sent to walking exercise. From this point improvement was more rapid, exercise being continually increased as the animal gained strength, blisters being applied at intervals.

August 15. Trotting exercise, which after a little was increased to slow cantering.

October 15. Placed at ordinary polo work, schooling, &c.

January 1, 1908. Played polo, and continued to do so without apparently experiencing any inconvenience from the affected leg, which by this time had almost regained its normal size. She now became a first-class polo tournament pony. During all this time every effort was made to keep the mare in good healthy condition, strychnine powders being given from time to time.

Remarks.—It occurs to me that many cases which are put down to shoulder lameness, exact position unknown, may be due to a slight affection of this nerve, particularly where much wasting of the muscles is observed and symptoms of "supporting leg-lameness" are prominent. I have seen many cases of what I considered shoulder lameness, and many have been pointed out to me as shoulder lameness, but in none have I ever seen wasting so marked as in this disease. From the anatomy of the region, and its exposed position, I should think that a great many more cases occur than the text-books and recorded cases lead us to believe.

It may be argued that the expense of keeping an animal invalided for so long would be more than it was worth. This may be the case with old animals, but it was not so in this instance. The mare was originally bought for £20, when she had been lame for a month; the following year, after having played several tournaments, her owner sold her for 50 gns., and told me that had its history not made buyers sceptical as to the affected leg standing prolonged work she would have sold for much more. Some months later I heard that the animal was still going sound.

CYSTS ON THE ANTERIOR SCAPULAR REGION.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

These are not uncommon in country horses, especially in young animals when first put to work. The usual site is over the anteaspinatus muscle.

Some are rather extensive in size; they have a thick wall which is firmly attached to the intermuscular connective tissue, they contain a dark yellow fluid, and the interior of the sac is smooth.

As regards treatment, simple incision along the length of the sac,

removal of the contents, and plugging the cavity with tow soaked in tr. iodine will suffice in some cases. In others the best treatment is to excise the sac; this will prevent a recurrence. When the sac is diffuse, it is not possible to excise it intact, as the walls are deeply attached to the underlying muscles; it may first be opened and the wall can then be dissected away. I have not found it possible to obtain healing by first intention, even when aseptic precautions are carried out as far as can be done.

A "BULL-DOG" CALF.

By R. WAGHORNE, V.S.

Edenbridge.

Malformations in calves are by no means rare, and the forms they take are very curious, but I have never before seen one so much like a bull-dog in shape and size as a monstrosity which I removed from a young cow at her second calving a few days ago. This cow went her full time of forty-one weeks, and was in labour for an hour and a half. As the case did not seem to be making progress towards delivery, I was summoned to render help, and after some little manipulation removed a calf with a thick short skull, a face very like that of a bull-dog, and a short squat body with a foot attached at either corner, but without any leg bones whatever. It was alive when born, and survived for about an hour, shaking its head and opening and closing its eyes. It did not, however, make a noise of any kind.

The cow eventually did well.

CYSTS IN THE MAXILLARY SINUS.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

I have had two cases of the above, both in young horses. The symptoms were a loud snoring sound during inspiration, marked bulging of the submaxillary bone in the affected side, and a slight muco-purulent nasal discharge.

On trephining the cases, the bone is found to be very thin, and the instrument goes through when slight pressure is applied. A very large amount of straw-coloured fluid escapes.

After-treatment consists in washing out the sinuses and keeping the openings patent for some time. Both cases made a good recovery.

CAVERNOUS ANGIOMA OF THE LIVER OF A COW.

By A. M. TROTTER.

Glasgow.

Kitt, in his text-book of "Comparative General Pathology," classifies angioma of the liver into capillary telangiectasis and cavernous. The former is the term applied to that variety which is so frequently found whilst making autopsies on aged animals slaughtered for food. It is with reference to the latter variety that this note deals.

The subject was an aged Irish cow in poor condition. The liver was smaller than normal. At the extreme end of the left lobe was an enlargement which was afterwards found to measure 5 in. by 4½ in. by 3 in. The surface of this enlargement was composed of fibrous tissue, and the liver parenchyma was found extending in a greater or less degree for some distance over it at its edges. On manipulation it was, as a rule, soft and doughy; but in places it was hard, rotund, and movable, indicating the presence of bodies in the substance of the mass. On incision, a large quantity of dark-coloured blood escaped. The mass was oval in shape, sharply defined, and limited by a dense fibrous capsule, evidently formed through pressure at the expense of the normal liver tissue. From this capsule there were given off bands of fibrous tissue, which, by dividing, subdividing, and uniting, formed a well-marked network, giving the cut surface in some places the appearance of erectile tissue, in others that of a sponge. From the interspaces thus formed the blood above referred to oozed. The trabeculæ varied in thickness, and in the case of some of the larger interspaces the inner surface was observed to be smooth and glistening. To the touch the cut surface was smooth and soft, with here and there a distinct "shotty" sensation, due to the presence in a number of the spaces of hard bodies, which, on examination, were seen to be thrombi, varying in size according to the calibre of the containing space—some of the thickness of the thumb, but the majority of the size of a vetch or large pea. They were, as a rule, of a dark colour, but occasionally they were mottled, white, grey, or yellow. Some of these bodies had been severed by the incision, and, on the cut surfaces being pulled apart, some of the severed portions became detached, while others protruded from the cut surface and were found to be attached in a greater or less degree to the trabeculæ. The surface of these thrombi were either smooth or slightly uneven, and often cut up by sulci, giving them the appearance of being slightly ridged. When cut they were

seen to be formed by concentric laminæ, and the mottled appearance was seen to be due to alternating layers of different hues. In the centre of some of the larger thrombi was found a calcareous deposit. Throughout the liver were numerous small capillary telangiectases, and the liver itself was markedly affected with cirrhosis, due to the presence of *Distoma hepaticum* in the bile-ducts.

Microscopical Examination.—The stroma was composed of loose, fibrous tissue, as a rule densely cellular, and contained numerous blood-vessels. The spaces varied in shape and size. Some had a tendency to rotundity, whilst others were irregular. The endothelium was in places well marked, but at others had become obliterated and replaced by a dense deposit of cells, many of which were undergoing chromatin degeneration. At the edge, the endothelium could be traced for a variable distance into these cellular deposits, in which it finally became merged. Blood corpuscles were seen to have penetrated into their interior. They were evidently leucocytes and plaques deposited through the slowing or cessation of the flow of blood. These cellular deposits were undoubtedly the beginning of thrombi. From their free margin were given off branches, which, penetrating into the lumen of the space, joined the blood contents. In many of the spaces well-marked thrombi, composed of fibrin and cells, were present. Some of these thrombi were seen to be undergoing organization. In one or two instances the organization of the thrombus was complete, and what had formerly been a blood space was now filled by fibrous tissue, the limiting wall of the pre-existent space being quite apparent. In one or two instances canalization of the thrombus had occurred. In the interior of some of the thrombi, and also in some parts of the stroma, crystals of hæmatoidin were present.

Professor Wooldridge has been appointed Treasurer *pro tem.* for the National Veterinary Association during the regrettable illness of the Hon. Treasurer, Mr. J. F. Simpson. He would be glad to receive the members' subscriptions at their earliest convenience.

It is reported that Lieut.-Col. Joslen, F.R.C.V.S., Indian Civil Veterinary Department, has met his death as the result of a trap accident in India.

Canine Clinical Notes.

AN INTERESTING SPLEEN: A CASE OF HODGKINS' DISEASE.

By D. FORWELL, M.R.C.V.S.

Towcester.

The patient, a well-bred bull-dog, aged 5 years and 9 months, had been in the owner's possession for about two years, and I had known the dog during the whole of that time. He was apparently in good health until four months ago, when it was noticed that after exercise he became tired and breathed abnormally, coughing and retching occasionally. About six weeks ago I discovered a couple of enlarged glands in the throat, just in front of the sternum, and these have steadily increased in size until at the present moment they are each about the size of a hen's egg. Two others also developed in the hind-quarters, one on each hind-leg, just above the hock in the gastrocnemius muscle. All were freely movable under the skin. The body temperature varied between 102° F. and 103° F., and about six weeks ago I removed a tumour about the size of a pullet's egg from the region of the groin, where it was in the position of an inguinal testicle; and at the same time I removed the right testicle, as it was abnormally placed, and close to the tumour. This wound healed well and gave no trouble, but as the dog began perceptibly to waste away, about three weeks afterwards, I discussed with the owner the question of further advice.

At my request Professor Hobday was called in consultation, and the case being deemed hopeless, the patient was chloroformed to death.

Post-mortem examination revealed the presence of a large group of five tumours in the pleural cavity, adherent to the pleura itself, and each about the size of a walnut. There were two others on the mesentery. The liver was enlarged, but not otherwise diseased. The kidneys were normal, but the spleen was enormously enlarged, weighing 2 lb. 5½ oz., and measuring 18 in. long by 5½ in. broad, and a thickness of 2 in. in several places.

The specimen was sent to Sir John McFadyean, who kindly informed me that it was a typical case of Hodgkins' disease.

CHRONIC NEPHRITIS IN THE DOG.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

Subject.—A fox-terrier dog, aged about six years.

History.—For some time the animal has been gradually becoming emaciated; the appetite is capricious; marked anæmia is a prominent symptom, the gums being very pallid.

Examination of the heart shows a markedly increased cardiac impulse, also palpitation produced by the slightest exertion, and accelerated respirations. No abnormality of the cardiac sounds could be detected, no thirst, and no renal symptoms. The animal became more emaciated, and one morning was found dead.

Autopsy.—The right kidney was atrophied to a surprising extent, the capsule was firmly adherent, and the surface of the organ irregular, and in section the texture was so tough as to almost resemble cartilage. The left kidney was not so extensively diseased, but showed marked resistance to the knife. The colour of both organs was pale. The heart showed the left ventricle to be hypertrophied to an extensive degree.

Remarks.—The absence of renal symptoms in the above case is interesting. There is no doubt but that renal diseases are far commoner in the dog than is usually imagined. The connection between chronic nephritis and canine typhus is an interesting point to the clinician. In many instances the primary symptoms of canine typhus are those attributable to a renal affection—viz., stiffness in the loins, frequent micturition, marked thirst, emaciation, and albuminuria; these are followed by the classical symptoms of the disease. It is probable that in such instances the renal affection was present prior to the attack of canine typhus, although causing no appreciable symptoms.

Abstracts and Reports.

REMARKS ON THE TREATMENT OF WOUNDS.[1]

By Sir W. WATSON CHEYNE, Bart., F.R.S., F.R.C.S.Eng.

Senior Surgeon to King's College Hospital, &c.

About a year ago in the Bradshaw lecture[2] I went into the subject of the treatment of wounds, and pointed out what I considered to be the essential factors to be attended to in trying to obtain an aseptic result. I also ventured to criticize some of the details of the methods which are so generally employed by surgeons at the present time, and which seemed to me to be imperfect from a bacteriological point of view, and thus were apt to lead to failure in securing the desired result.

It is most unfortunate that the idea seems to have grown up that the success or non-success of the treatment of wounds depends to a large extent on the materials used, and on the method by which the sterilization of these materials is effected.

The result of this idea is that the failures in avoiding suppuration are apt to be attributed to the use of this or that material, or of this or that method of sterilization, rather than to the true reason—namely, failure on the part of the surgeon to meet the bacteriological requirements of the case. Hence we have the extraordinary craze at the present time to banish the use of antiseptics, the failures being attributed to their employment and not to the real cause—namely, faulty manipulations on the part of the surgeon. As a matter of fact, efficient sterilization of the instruments, materials, &c., can be brought about in various ways, but the ascepticity of the results depends essentially on the care that is taken to prevent re-infection of the hands of the operator and his assistants, the instruments, materials, &c., during the course of the operation, for if these become infected again sepsis in the wound may very readily follow.

The discussion which is going on about what is falsely called aseptic treatment as against the use of antiseptics is utterly unscientific, and misses the real point at issue. It reminds one of the early objections raised against Lister's work. Many, under the impression that the essence of it was the use of carbolic acid, began washing their wounds with carbolic acid, and naturally failed to get the desired results. They accordingly wrote and spoke against the method, but they failed to recognize that the essence of the matter was not the use of carbolic acid, but the way in which it was used. So at the present time the stress which is laid on the fittings of operating theatres, the use of masks, rubber gloves, dry swabs, and all the other paraphernalia which are the fashion just now, is apt to overshadow the real point in obtaining an aseptic result—viz., what the surgeon

[1] See paper on "A Comparison between the Antiseptic and Aseptic Methods of Operation, with Special Reference to the Occurrence of Suppuration," based upon the results obtained at St. George's Hospital during the years 1906 and 1908 respectively. By H. S. Pendlebury, F.R.C.S.Eng., and Ivor Back, F.R.C.S.Eng. *Lancet*, November 27, 1909, p. 1578.

[2] See Veterinary Journal, February, 1909.

is doing with his hands. It is in the manipulations carried out by the surgeon that the real essence of the matter lies, not in these various fanciful surroundings. The personal equation of the operator has more to do with the result than anything else.

There are certainly two schools at the present time, but the essential point of difference is not whether use should be made of antiseptics in the course of an operation or not. The essence of the question at issue is whether the treatment of wounds shall be looked on as a bacteriological problem or not. On the one hand we have those, among whom I may include myself, who look on the treatment of a wound as a bacteriological problem of a complex character, and who take advantage of anything which aids in fulfilling the bacteriological requirements of the case, not forgetting, of course, that the tissues themselves have to play an important but secondary part. The other school looks on the action of the tissues as the essential element and the bacteriological question as of secondary importance. They try, therefore, to irritate the tissues as little as possible, and sacrifice various things which would be of value if the case were regarded as a bacteriological problem. In doing so they are apt to be led away by the non-essential surroundings, and forget what an element the personal equation plays in the result. It is, I fear, too often a case of keeping the outside of the cup and platter clean. In my opinion, this view is a very serious fallacy, and the essential point is what the surgeon does with his hands during the operation, and not the surroundings in which he operates.

I have felt certain for a long time that the results obtained by those who endeavour to do away with the use of antiseptics, and who rigidly employ what is falsely called the aseptic method, cannot be compared with those who are got when the treatment of a wound is looked on as a problem in bacteriological work, and when the surgeon acts accordingly. Till recently, however, I had no actual statistics at hand as regards the frequency of suppuration in wounds treated by the recent methods, and consequently I have always felt that, though I was right, my argument was not altogether convincing, seeing that I could only speak generally. This difficulty has, however, been remedied by the publication in the *Lancet* of November 27, 1909, of the results of the so-called aseptic method which have been obtained at St. George's Hospital.

Before, however, I go on to refer to these results I may mention a few of the points on which my conclusions adverse to this method were founded. In the first place, this so-called aseptic method, with its sterilizers, boiled water, heated towels, dry swabs, dry dressings, saline solutions, masks, &c., is full of loopholes, and does not in any way meet the bacteriological requirements of the case. To wash the skin with soap and water, even though the water is boiled, and then rub it over with a 1 in 500 solution of biniodide of mercury and spirit, is not in any way a reliable method of sterilizing the field of operation. To lay instruments on a dry, sterilized towel, and to work with them for perhaps half an hour, or an hour or more, without re-sterilizing either them or the hands of the surgeon or his assistants is utterly opposed to any real attempt at keeping wounds aseptic. To wear the same overall during a whole afternoon's operations, even though it was sterilized in an autoclave in the first instance, is hardly consistent

with asepsis. To put on this sterilized overall after the hands have been washed, but before they have been disinfected, as is so often done, is to infect it at once, still more so to put it on and then subsequently arrange blankets, &c. What bacteriologist would ever dream of carrying out his work under such conditions? No doubt the answer is that the tissues themselves have a great power of dealing with organisms which come in contact with them, provided that the latter are not too numerous or too virulent, and provided that the tissues themselves are very tenderly dealt with, so as not to impair seriously their power of resistance. This is, no doubt, to a certain extent true, and very fortunately so; but one must not try the tissues too far, or place too much reliance on their action. The less the tissues have to do in the way of destroying bacteria the greater the probability, and, I may even say, the certainty of securing an aseptic result.

As regards the imperfections of these methods, I also judge by the way in which many nurses who have been trained in hospitals where these plans are carried out act at an operation as indicating the training which they have received and the ideas which they have gathered from it. Nurses are always using the terms "sterilized" and "aseptic," but the majority of those whom one comes across in private practice have no real conception of their meaning. Ask a nurse who is wearing rubber gloves which have been well boiled, and who has perhaps been washing sponges in sublimate solution, and whose gloves are thus perfectly aseptic, to come and hold a retractor. What is the first thing that she does? Instead of coming promptly she rushes off to a tap or basin of water and carefully rinses off the antiseptic and soils her gloves, and then comes beaming with satisfaction at having demonstrated how thoroughly aseptic she is. Her annoyance when I decline her assistance after this performance cannot be concealed, and she evidently regards me as an extreme faddist and quite behind the times. Only quite recently I had two "aseptic" nurses to assist at an operation, who, having by my direction boiled some towels to surround the area of the operation, and, not having a basin at hand, placed them in the commode till they were required! I could fill pages with the absurd errors which I have seen, and which would be highly amusing if they did not imperil the well-being of the patient. One would have expected that, coming from a hospital where these difficult aseptic methods are employed, the nurses would have been especially thoroughly drilled in the extreme care that it is necessary to exercise in every direction during an operation if there is to be any certainty of success as regards the occurrence of sepsis. But, on the contrary, I find that so long as the instruments or materials have been immersed in boiling water, for however short a time, or heated in one of the imperfect sterilizers which are on the market, everything is all right, whatever may have happened to these things since they were prepared.

Further, I frequently hear the experience of medical men who have been visiting hospitals abroad and at home where this treatment is carried out, and their reports of the aseptic results as obtained by the modern methods are not particularly favourable, and they constantly express themselves puzzled as to how we obtain the results which we do at King's College Hospital, where our operating-theatre

cannot be said to be in any way a model of a modern operating-theatre.

I have also been very much impressed by what one hears of the difficulty of sterilizing ligatures, skin, &c., and of the frequency of stitch abscesses (I have known a large collection of pus in the pelvis after a clean ovariotomy spoken of as a stitch abscess), things which very seldom come under our notice, and I have been especially struck by the incredulity which is evident when, in discussing these matters, I have said that I have had little or no experience of them. The conversation is at once dropped, evidently from a desire not to lead me to imperil my immortal soul by further perjury. As an example of this point, and the results generally obtained in Germany, I was very much interested, in reading Bier's "Text-book on Hyperæmia," to come across the following remarks on p. 287 in the English translation. In speaking of the treatment of infected wounds, he says: "Not infrequently laparotomies which cannot be executed asceptically, and even radical operations for hernia, are followed by a mild, small infection leading to the formation of sinuses."

And again, on p. 334, in the course of some remarks on the prophylactic treatment of wounds suspected of infection, he says: "In connection with this experience [the failure of the hyperæmic treatment in some cases] are experiments which I have undertaken with a view to change the aseptic treatment of wounds. It would be incredibly foolish for a surgeon to question its brilliant accomplishments. But, in spite of asepsis, we have not yet progressed so far that we can guarantee with certainty the healing by first intention of all wounds adapted to suture. How often, for example, does it occur that silk threads are expelled, or that a wound which, on the whole, has healed by first intention shows small defects (stitch abscesses, sinuses)!"

These are to me astonishing statements, and what astonishes me most is the matter-of-fact way in which these failures are spoken of, as if they were everyday occurrences. If I had a "small defect" in a wound I should be very seriously unhappy, and should not rest till I had tried to find out what was the error which I had committed.

The result of these experiences is manifested in various ways. Thus we have many surgeons objecting to buried sutures for the reason that they are very apt to be extruded. We have, again, various devices for bringing together the edges of the skin so as to avoid if possible the occurrence of stitch abscesses. We have the abandonment by surgeons of many useful materials, such as catgut, marine sponges, &c., on account of the supposed difficulty in disinfecting them, the idea being that nothing but heat is a trustworthy disinfecting agent. To show how this fear of the danger of infection, which can only be inspired by experience, affects the conduct of an operation, I may mention that I have more than once had remarks made to me by distinguished visitors as to the mode in which I deal with the sac in performing radical cure of hernia. In the great majority of cases, for reasons which I need not go into here, I twist the sac and push it upwards under the abdominal wall, and the objection that is made is that in leaving a sac so tightly twisted as I do I am leaving a piece of dead tissue which will lead to suppuration. I can only say that in my experience this has not occurred, and that

even if it were dead, which I doubt, to leave a piece of dead tissue, provided that it is aseptic, is a matter of little or no consequence from the point of view of infection, provided the measures employed for keeping out bacteria are really efficient.

In yet another direction I notice the way in which the experience of those who employ this aseptic treatment affects their practice—viz., that they hesitate in doing things which can readily be done safely, and which ought to be done. For example, quite recently a distinguished orthopædic surgeon, in speaking of "tuberculous abscesses," stated that "numbers of children die in consequence of the routine opening of tuberculous abscesses," and he holds that better results are obtained if these abscesses are not, as a rule, dealt with at an early period. This is quite contrary to our experience, and is, to my mind, only another example of the failure of the so-called aseptic methods. That these methods should fail in such a condition as a psoas abscess is only what one would expect, because there we are dealing with an opening in the tissues, lined by healthy tissue with its strong anti-bacterial powers, but with a cavity containing putrescent material, the walls of which are themselves composed in great part of degenerated devitalized tissues. That is just the sort of case where we would expect failure, and it is evident from the passage I have quoted that this expectation is correct. On the contrary, the success obtained by dealing early with psoas abscesses was one of the points of which Lord Lister was always most proud, and we, who have been his immediate pupils, find that this success can still be obtained even to a larger extent than formerly.

I have referred to the results obtained at St. George's Hospital, as published in the *Lancet* of November 27, and I may now make a few remarks with regard to them. In the first place, it seems to me that the gentlemen who collected the results are quite satisfied with them, and in fact they end their paper by saying that "We hope that these statistics will prove useful and of interest to the practitioner, and help him to give a patient a fair idea of the average chance of aseptic healing in the commoner operations." The main object of the paper appears to be to contract the results which they obtained at St. George's Hospital in the first place when they employed anti-septics, in what way is not exactly stated, and in the second place since some alteration was made in regard to the use of antiseptics. It is not really clear from the paper what the alterations were, but in any case the results as obtained in 1906 by the methods then employed, which they speak of as antiseptic methods, were 13·6 per cent. of septic cases, falling in 1908 under improved methods to a percentage of 7·2 of septic cases. As the details of the two plans are not fully given I cannot criticize them, but it strikes me that probably the whole difference in the results is accounted for by the fact that in the second period nearly all the surgeons used rubber gloves; in the earlier period this was apparently not the case. There is no doubt that boiled rubber gloves are of the greatest value where the methods of dis-infection of the skin and especially of the hands, are faulty, and I believe that this point forms practically the essential cause of the difference between the results in the two years which are contrasted, and not the question of the use or disuse of antiseptics.

The authors, in addition to mentioning the total cases, refer

especially to five groups, and these show very interesting results. Taking the 1908 statistics, the class of cases in which the best results are noted was apparently operations for quiescent appendicitis where the percentage of septic cases is only 3·3 per cent. This agrees with what we are now thoroughly familiar—namely, that the peritoneum has a power of dealing with bacteria which may come in contact with it in a way which is not equalled by any other tissue of the body. The opposite extreme is given by the operations on the breast, where the percentage of septic cases reaches the large amount of 12·2. This result is exactly what I should have expected. Operations for cancer of the breast are extensive operations, and take a very considerable amount of time, and thus on the one hand ample opportunity is afforded for infection of the wound where no sterilization of instruments or hands, &c., takes place during the course of the operation, while the tissues which are dealt with have not nearly the efficacy as bactericidal agents which the peritoneum has.

I think that Mr. Pendlebury and Mr. Back are to be congratulated on the very careful way in which they have gone into the hospital records and on the very fair way in which they have stated the results which have been obtained. In my opinion, however, if these are the best results that can be got by the recent aseptic methods the sooner they are abandoned and their place taken by a line of treatment in which the main attention is paid to the bacteriological problem the better for the well-being of the patient and the ease of mind of the surgeon.

I may say that the paper to which I am referring has created a great deal of interest and excitement among the junior staff (house surgeons, &c.) at King's College Hospital, and I was very much gratified to find that on their own initiative, and without any suggestion on my part, they had gone into the results which have been obtained in my wards since the beginning of 1901, and to my surprise and pleasure I have received from them complete and very carefully worked-out statistics of all the clean cases on which I have operated during that period, the results of which I have verified and shall now produce. I may say that these statistics have been put together on the same lines as the statistics at St. George's Hospital, which I consider to be the correct ones—that is to say, they are only statistics of clean cases; in other words, of cases where the surgeon had unbroken skin to start with, and where in the course of the operation he did not have to open any mucous cavity, nor did he come into contact with any focus which was the seat of septic infection. For example, intestinal resections, gastro-enterostomies, operations on the gall-bladder and bile-ducts, renal calculus, &c., are excluded, and of course all operations on the rectum, bladder, urethra, mouth, throat, abscesses, septic sinuses, &c. I am very much struck by the large proportion of these cases as contrasted with "clean" cases which occur in one's hospital work.

The numbers work out at a total of 1,028 clean cases operated on during the eight years, and of these nineteen are classed as becoming infected. It is, however, very doubtful whether several of these nineteen cases should be included as I shall mention immediately.

There is a very marked difference between our results and those obtained at St. George's Hospital. Had the results been the same as

in that hospital, instead of nineteen septic cases we should, according to their 1906 statistics, have had 140 septic cases, or according to the improved results of 1908, the numbers ought to have been seventy-four.

A most important point to be noted is the conditions under which these results were obtained. In the first place we have only one operating theatre, used by all the surgeons and for all cases, septic or otherwise, and also used for lectures. Our theatre is very much as it was built and fitted out some sixty years ago. With the exception of a tesselated floor we have none of the modern arrangements; in fact, I expect it is the worst operating theatre in any of the large London hospitals.

Another and very important point is that the after-dressing of the cases is left to the house surgeon; indeed, in most cases, if I have a very full afternoon, I leave the stitching up of the skin wound to the house surgeon while I get on with the next case. Of course, a house surgeon, however excellent, is only a beginner, and to him the precautions necessary to procure an aseptic result are not yet automatic; he has constantly to think what he is about from an aseptic point of view, and I think it is very remarkable that the number of septic cases has been so few, when we remember that the men change every six months, and that during these eight years there have been seventeen house surgeons and sets of dressers. Fortunately there is a very healthy spirit of rivalry among our house surgeons. We have three house surgeons, one for each full surgeon, and they are very strong partisans, each trying to show better results than the others. When a house surgeon takes up his appointment he sets two chief aims before him. The first is to put a larger number of cases through his wards than the others, and the second to show better results, more especially as regards asepsis. With the first aim I have no sympathy whatever. I do not see why I should be overworked simply in order that my staff may crow over the others. The second aim, on the contrary, I encourage in every way. It means that the men take their work more seriously: it develops habits of care and thoughtfulness, and it trains them to regard the aseptic treatment of wounds as a matter of paramount importance. Each faction watches the others most closely, and if suppuration, however slight, occurs in any case we very soon hear of it. I venture to think that this is a spirit which should be very carefully fostered. Without it, indeed, I could not leave the after-treatment of the wounds to the house surgeon with any degree of comfort.

I may also draw attention to one point which shows very convincingly to what an extent the asepticity of the results depends on the personal equation. The cases were given to me arranged in years, and I find that in four of these years there was one septic case each year, in two years there were three septic cases each year; in one year there were four septic cases, and in one there were five. These two years in which nine septic cases occurred, nearly half the total were consecutive years, and for a time I was puzzled to account for this large proportion of failures. It occurred to me, however, to note the dates of admission of these nine cases, and I then found that seven out of the nine occurred under the care of one house surgeon. As I had seventeen house surgeons during these eight years this leaves

twelve septic cases to be distributed among sixteen men. As a matter of fact, several house surgeons had no septic case during their term of office, some had one case, and some had two.

I do not put these results forward as an example of the best that can be obtained; in these cases much has been left to beginners, and I think they are to be congratulated on the careful way in which they have done their work. But as experience and skill increase the precautions necessary to secure an aseptic result become more or less automatic; one feels instinctively if anything is wrong, and failures become more and more only the result of accidents.

One other point is shown by these facts—viz., that the extravagant amounts which are sometimes expended on operating theatres, fittings, &c., are to a large extent unnecessary. I have no objection to a nice well-fitted operating theatre at all, but things are sometimes carried to an extreme, and the operating theatre is apt to assume an undue importance in the eyes of those using it. Our operating theatre and arrangements cannot compare for a moment with those at St. George's Hospital, and yet they get four times as much sepsis as we do.

I think that the above facts show that there is a great deal more in the treatment of wounds than simple cleanliness and the avoidance of irritation. I do not believe that a surgeon will get the best results unless he takes the view that suppuration in clean wounds is avoidable, and that the way to avoid it is to look on the treatment of a wound as a bacteriological problem, and to act accordingly.—*Lancet.*

SOUTH AUSTRALIAN "DRY BIBLE."

By Veterinary-Surgeon DESMOND.

At last the cause of that dread disease "dry bible," which is responsible for the annual loss of many thousands of pounds' worth of cattle in South Australia alone, has been officially reported to have been ascertained. The discoverer is the Government Bacteriologist (Veterinary-Surgeon Desmond), who has forwarded the appended interesting and valuable interim report on the subject to the Commissioner of Crown Lands.

In January, 1903, the South Australian Council of Agriculture decided to enquire into the occurrence of a disease of horned cattle commonly known as "dry bible," and for this purpose thousands of circular letters were forwarded to owners of live stock. About 100 replies were received from different parts of the State, and when these had been reviewed the following results were obtained, viz.: Symptoms well described, 16; cattle affected which were supplied with bone meal, salt, and sulphate of iron, 10; cattle affected on green feed, 2; wrong diagnosis, 4; illness supposed to be caused through eating poison weeds, 2; abortive particulars, 66. These replies were far from being satisfactory, and when the owners of sick animals were asked why they did not answer the circular letter the usual reply was: "It was too complicated and contained too many questions." The circular contained over forty questions, and asked for replies that were far too difficult for the average farmer to answer. In 1906

instructions were given that I should make a study of the disease, and I proceeded to Morchard, where a great number of animals were affected. While in this locality my services were asked for by the Government of Tasmania to assist the Government Veterinary Surgeon of the Island State to investigate a mysterious disease of cattle. No difficulty was experienced in proving to the Government Veterinary Surgeon and the Chief Inspector of Stock there that the disease was identical with that which caused such a large death-rate among cattle in South Australia and Victoria. While in Tasmania much laboratory work was done in order to solve the problem, and has been of great practical value in the present investigation. The cultures obtained in Tasmania are still growing in this laboratory, and are transferred every month.

In 1907 the Minister of Agriculture (Hon. L. O'Loughlin), recognizing the seriousness of the trouble in the dairying districts of this State, gave instructions that I was to make a systematic study of the disease with the object of finding out a means of prevention, and, if possible, a line of treatment for affected animals. It was then pointed out that the Minister had given explicit instructions that on no account were the weekly lectures on veterinury science at the Roseworthy Agricultural College to be put aside for any other work, and that if it were decided to have the disease investigated additional help would be required to do the routine work of the veterinary department, and deliver lectures at the Roseworthy Agricultural College and the School of Mines. Accordingly, Mr. Loxton was appointed Assistant Government Veterinary Surgeon in January, 1908. When he had mastered the multitudinous duties attached to the veterinary department, I was at liberty to devote my time to ascertaining the cause of the trouble. In March, 1909, a visit was made to Orroroo, Quorn, and Hammond. At Orroroo and Quorn the cases were scattered, but at Hammond a number of cases were found under conditions favourable for a thorough investigation. A farm, recognized as a hotbed for the disease, where a large number of cattle succumbed every year and the losses during the early months of the present year amounted to several hundred pounds, and where all kinds of horned cattle, such as bullocks, cows, steers, and heifers, were affected, was chosen as the site for studying the disease in all its phases. The farm had an abundance of feed and two wells of water. The conditions in which the cattle were kept were contrary to the general opinion that the dryness of the feed was the cause of the trouble. Opportunities were offered to study the three forms of the disease, viz., the acute form, in which death takes place in a few hours; the subacute form, in which the affected animals live many days; and the chronic form, when the animals are sick for many weeks, and from which recovery takes place in a small number of cases.

The symptoms of this disease have been so often described that owners have no difficulty in recognizing it when their cattle are affected. The following additional particulars were noted on close observation of sick animals: (1) In the acute stage the affected animals are easily excited and show well-marked brain symptoms, the pulse and respiration are increased, while the temperature is about normal. Unconsciousness occurs at short intervals, and the animal falls to the ground, lying with its nose to the flank, death taking place in from a

few hours to one or two days. Such cases, when submitted to a careful *post-mortem* examination, show well-marked congestion of the delicate membrane covering the brain, and other symptoms which will be described in a future report. (2) In the subacute stage, besides the usual symptoms, such as the glassy eye, &c., there is a spasmodic jerking of the muscles of the fore part of the body and a continuous movement of the muscles above the eyes. (3) The chronic stage is most complex, and the deductions to account for the frequent unconsciousness must be postponed until a more definite investigation is made. Animals in this stage will partake of food and water, and perform all natural functions, remaining in a recumbent position for many weeks, until they are a mass of sores where their bodies come in contact with the ground, often causing the owner to destroy them to end their suffering, and to dispense with the cost of feeding and watering. There are a few cases recorded by observant owners in which an affected animal has recovered from the disease, but has succumbed to a fresh attack in the following year. In the numerous cases that have been recorded only one case is known where an animal has survived a second attack. One important feature was observed during the present year. Stiffening of the muscles (*rigor mortis*) and decomposition, even when exposed to the fierce rays of the sun in summer, is not rapid. A disagreeable, fœtid smell is given off from the carcase of an animal when submitted to a *post-mortem* examination a few moments after death takes place, or in animals that have been slaughtered for investigation purposes. Subsequent work in the laboratory decided what was the cause of this disagreeable odour. Cultures were made from all *post-mortem* examinations of animals slaughtered in different stages of the disease, and from those that had recently died. Tubes of media were inoculated with smears from the different organs and glands. The difficulties of performing field bacteriology were overcome by a simple contrivance, and satisfactory results were obtained. The weather was exceedingly warm, and an incubator for the development of any germs which were located in the tissues was not required. The majority of the inoculated tubes showed an abundant growth of various conditions and colours. These have formed the subject of extensive laboratory research.

While at Hammond I was ably assisted in carrying out the inoculation experiments by Mr. Loxton, who worked day and night in Adelaide preparing the necessary medium for the cultures. After spending three weeks in the North, it was decided to visit Adelaide for the purpose of submitting the large amount of material which had been collected to a searching laboratory investigation, the result of which was that three unusual micro-organisms were isolated and obtained in pure cultures. The next step was to inoculate animals with these cultures for the purpose of finding out if they would produce a disease, known or otherwise. The organisms were numbered 1, 2, and 3. No. 1 in a pure form was injected in large doses into two cows, and had not the slightest effect on their health, nor did it disturb them in any way. Culture No. 2 was next experimented with, and, although it did not kill the animals which were inoculated, it made them sick, and put them off their food for several days. It was resolved to inject cultures Nos. 1 and 2 mixed together. No fatal results were obtained, and the symptoms produced were identical

with those obtained when No. 2 culture was the subject of inoculation. No. 3 culture, a most difficult organism to work out in its many phases, was last experimented with, and produced quite definite results. Several cows were inoculated with it, and the following is a *résumé* of its action :—

A few moments after injection into a healthy cow there is a shivering fit, and the animal falls to the ground, the respirations are hurried, and the animal is very distressed. This, in the majority of cases, lasts only a few moments, and the animal then rises to its feet and presents the following symptoms: Pulse, respirations, and temperature much accelerated, trembling of the fore-quarters, twitching of the muscles above the eye, and a glassy appearance of the eyes. Death may take place in from nine to ten hours, and in other cases a fatal issue is not obtained until after several days. All the experimental animals were submitted to a most searching *post-mortem* examination, and all the lesions found in cattle which acquire the disease in a state of nature were present. Several sheep have been killed with this micro-organism, death taking place in about four hours. Although such a fatal organism to ruminants, the small laboratory animals—the rabbit and guinea-pig—do not succumb to experiments. This germ has already been submitted to a searching investigation, it has been repeatedly cultivated from the tissues of the various animals killed by inoculation, and when again injected into healthy cows has caused death under identical conditions. The rules which are laid down and which govern bacteriological research are termed the "postulates" of Professor Koch, and require that a micro-organism, to be recognized as a specific agent in the production of pathological alterations (diseased conditions), should fulfil four conditions: "(1) The micro-organism must be found in the blood, lymph, or diseased tissues of man or animals suffering from or dead of the disease. (2) The micro-organism must be isolated from the blood, lymph, or tissues, and cultivated in suitable media, *i.e.*, outside the animal body. These pure cultivations must be carried on through successive generations of the organism. (3) A pure culture thus obtained must, when introduced into the body of a healthy animal, produce the disease in question. (4) Lastly, in the inoculated animal the same micro-organism must be again found." All these conditions, which are in many cases not possible to put into practice when investigating diseases peculiar to the human subject, have been repeated many times in the case of the micro-organisms isolated in the prosecution of this inquiry.

An important observation was noted in the North during the month of March, and is worthy of being recorded. At a large dairy farm on which a large number of cows were milked this disease appeared for the first time, and naturally the owner was alarmed. There could be no mistake as to the disease being the so-called "dry bible," and I destroyed the affected animals and submitted them to a searching *post-mortem* examination. On viewing the conditions in which the cattle were kept it was discovered that the water supply was collected by blocking up a road on which there was much traffic, and turning the water into a large water-hole. It was decided to treat the water supply with a liberal amount of sulphate of copper; this was done under my supervision, with the

satisfactory result that no more cases occurred on the farm. In the laboratory the following experiment was made: A quantity of water from the Adelaide supply, after passing through a sterile pressure filter, was collected in a sterile flask, and submitted to further sterilization for an hour by steam pressure at 15 lb., at a temperature of 250° F. This water was inoculated with a pure culture of the micro-organism which had killed the numerous cows inoculated with it, and placed in the incubator. A ready growth under these conditions was obtained.

During September a short visit was again made to Hammond, not for the purpose of seeing cattle affected with the disease, as the majority of cases occur in the autumn months, but to conduct inoculation experiments on animals kept in a locality where the disease appears every year. Five cows were secured, two were inoculated, while the remainder were brought on to Adelaide for further experiments. The two cows inoculated showed well-marked symptoms of the disease, and one succumbed after five days. The other, a large, strong cow, although ill for seven days, survived the experiment, and it was decided to leave her in the locality for the purpose of observing future developments. A large number of farmers were interested in the experiments, and all were unanimous in declaring that the symptoms, as shown in the incubated animals, were identical with "dry bible." The owner of the farm on which there was such a large death-rate last autumn was present at the *post-mortem* examination on the cow killed by the inoculation, and he remarked: "I have removed the hides from scores of cattle which have died of "dry bible," and cut up the carcases for burial or burning, and the appearance of this cow after the experiment and the condition of the internal organs are the same as the cattle affected on my farm."

In the *Journal of Agriculture* for August the following figures relating to "dry bible" are quoted from statistics furnished by the Government Statist: "In 1907 there were were 47,480 deaths from 'dry bible;' during 1908 there were 11,133 deaths of cattle, both within and outside counties, 'dry bible' being responsible for more than one-fifth of the number—namely, 2,395." The losses to this State are enormous, as the value of the animals can be computed to be between £4 and £5 a head. These figures are quoted in this report to show how necessary it is to spare no expense to solve, if possible, a means of prevention, whereby animals in localities where "dry bible" is prevalent can be prevented from being affected with this fatal disease. Such a step would be an important one in the interests of the economics of the State. I expect to elucidate many important additional features in the laboratory investigation now proceeding, which is of a severely searching nature, embracing all phases of the question, and which is necessary to verify those conclusions forced upon me so far by the definite reaction of those organisms isolated, and which I believe are the proximate cause of "dry bible." The details of this research with all data will form the subject of my report, which will be presented at the earliest possible date, and which must be withheld until complete verification enables me to reassure the public and to face the relentless inquiry of the scientific world.

(*The Register, Adelaide.*)

TESTS CONCERNING TUBERCLE BACILLI IN THE CIRCULATING BLOOD.

By Dr. E. C. SCHROEDER and Mr. W. E. COTTON.
Bureau of Animal Industry, Washington.

In a paper dealing with the occurrence of tubercle bacilli in the circulating blood, read before a medical society some months since and soon afterwards published in a medical journal,[1] there were recorded the results of microscopic examinations of the blood of 125 tuberculous individuals, some of whom were affected with only incipient tuberculosis, and the statement was made that tubercle bacilli were found in the blood of every one of them. In some cases only a few bacilli were seen, but "they were mostly in large numbers, and clumps of thirty to forty bacilli were not unusual, especially in cases of acute miliary tuberculosis." From his observations the author of that paper formulated the conclusion: "It appears that tuberculosis in all its forms is a bacteriæmia."

That tubercle bacilli occasionally float in the blood stream is hardly open to question, because of the occurrence of isolated lesions in the bodies of otherwise tuberculous as well as otherwise healthy individuals located in regions remote from the various channels that communicate with the exterior. The same is true when we consider cases of more or less generalized tuberculosis with many lesions in widely separated portions of the body, and cases of miliary tuberculosis with innumerable lesions of approximately, if not precisely, the same age and stage of development. But such occasional presence of tubercle bacilli in the circulating blood is a very different condition from their constant occurrence in it in sufficient numbers to justify the classification of tuberculosis as a bacteriæmia. Hence, Rosenberger's conclusion was received with considerable surprise and doubt.

Although the conclusion seemed sufficiently incredible because of the simple fact that a constant occurrence of tubercle bacilli in the blood of all tuberculous individuals could hardly have been overlooked by the host of investigators who have studied tuberculosis with no greatly different technique than Rosenberger used, we did not feel warranted in opposing it without offering some specific evidence. Because of the important bearing of the matter on the tuberculosis problem, the experiments hereinafter reported were carried out.

Rosenberger stated that he found tubercle bacilli on microscopic examination in the blood of every one of the 125 cases of tuberculosis he studied, notwithstanding that some of the cases were incipient and failed to show tubercle bacilli in the sputum. It was, therefore, almost taken for granted that the microscopic examination of blood, according to his method, of animals affected with advanced and long-standing tuberculosis, and animals that were expelling tubercle bacilli from their bodies in large numbers, would reveal at least a few tubercle bacilli. A considerable number of such microscopic examinations were made, but not a tubercle bacillus was found in our blood preparations, and hence we have to record wholly negative results with the blood of

[1] Rosenberger, Randle C., "The Presence of Tubercle Bacilli in the Circulating Blood in Tuberculosis." (Read before the Pathological Society of Philadelphia, December 10, 1908.) *American Journal of the Medical Sciences*, vol. cxxxvii., No. 2, pp. 267-269. Philadelphia and New York, February, 1909.

tuberculous animals. Similar negative results were obtained with the blood of tuberculous persons in two large New York hospitals.

It is not uncommon for virulent tubercle bacilli to be present in animal substances in numbers too small to serve for their detection by optical methods. For example, at the Experiment Station we found the intra-abdominal injection of guinea-pigs with suspected milk to be a test for tubercle bacilli that has fully fifty times the delicacy of a microscopic examination. Furthermore, tinctoral and optical methods of distinguishing between tubercle bacilli and other acid-fast bacteria are not wholly satisfactory; hence we concluded to inject a sufficient number of guinea-pigs with blood from a sufficient number of certainly tuberculous cattle to show conclusively that tubercle bacilli either are or are not commonly present in such blood.

Incidentally, it appears that Dr. Rosenberger failed to confirm adequately by animal experiments his surprising microscopic observations, which, if correct, would have been of the greatest value alone for the early and certain diagnosis of tuberculosis. In all, he inoculated only two guinea-pigs, of which he gives a record; one with blood from a tuberculous person who was expelling tubercle bacilli *per rectum*, and one with blood from a case of acute miliary tuberculosis. The development of tuberculosis in the latter guinea-pig cannot be regarded as a remarkable phenomenon. There is nothing about the fact that a guinea-pig contracted tuberculosis after an injection of blood obtained from a case of acute miliary tuberculosis that necessitates a modification of our currently accepted views on the presence of tubercle bacilli in the circulating blood. That is to say, we need not look upon tuberculosis as a bacteriæmia because tubercle bacilli were demonstrated in the blood of a kind in which we have long considered that they might sometimes occur.

This leaves one guinea-pig that may have some evidential value, but we must not lose sight of the fact that it was injected with blood obtained from a person who was expelling tubercle bacilli from his body and hence to some extent infecting his environment. We must also bear in mind that guinea-pigs are highly susceptible to tubercle bacilli injected into their bodies, and that it is often impossible for an investigator who handles much tuberculous material, who is in frequent contact with tuberculous persons, and whose environment may be characterized as containing tubercle bacilli, to eliminate all danger of extraneous tuberculous infection sufficiently to make a test satisfactory when he seeks to verify the tuberculous character of some material from a tuberculous individual by the injection of one, and only one, guinea-pig.

Summary of Present Tests.

Our own tests were made entirely with the blood of tuberculous cattle. In every case the blood was drawn from the jugular vein of the tuberculous animal and injected in its fresh, naturally warm state into the peritoneal cavity of a guinea-pig. The tuberculous cattle may be divided into four distinct lots, according to their tuberculous condition:—

(1) Four cattle, the precise tuberculous condition of which is known, because they were killed and examined *post mortem* shortly after blood was drawn from them for guinea-pig injections.

(2) Six cattle, known to be tuberculous because they had reacted

with tuberculin, because tubercle bacilli were found in their fæces on microscopic examination, and because their fæces were proven to be infectious by animal experiments.

(3) Nineteen cattle, known to be tuberculous because they had reacted with tuberculin and because tubercle bacilli were found in their fæces on microscopic examination.

(4) Thirteen cattle, known to be tuberculous because they had reacted with tuberculin.

We made no attempt to treat the blood used for the injections in any way, because we assumed that the best results would be obtained with it by transferring it as rapidly as possible from the tuberculous cattle to the peritoneal cavities of the guinea-pigs. It was learned from the injections that guinea-pigs tolerate a relatively large quantity of bovine blood in their peritoneal cavity. The guinea-pigs that died shortly after as the result of the blood injections (about 15 per cent. of all injected) with few exceptions showed extreme impaction and some inflammation of the large bowel, associated in several instances with invagination of the colon.

The possibility exists that the intraperitoneal injection of from 3 to 5 c.c. of fresh, warm blood from tuberculous cattle induces an immunity in guinea-pigs to the tubercle bacilli the blood may contain. Though this view is purely hypothetical and we know of nothing to sustain it, we have carried out an investigation to prove or disprove it, and will give the results later in this paper.

The total number of cattle from which blood injections were made was forty-two, and these, as their records show, represent a considerable variety relative to the severity and extent of the tuberculous disease with which they were affected. They ranged from animals that would not have been suspected to be diseased without a tuberculin test to a cow so badly affected that a calf of which she became the mother a little less than a year before her blood was used for guinea-pig injections was born affected with tuberculosis contracted from *ante-partum* exposure to her tuberculous body.

The total number of guinea-pigs injected was 104. Of these, sixteen died within a few days after the injection and no doubt as a result of it. Three died of intercurrent affections, but not until a sufficient period of time had passed for lesions of tuberculosis to become clearly manifest. The remaining eighty-five lived until they were killed after a lapse of from seven and one-half to eleven weeks, or an average for all of seventy days after they were injected. The three guinea-pigs that died of intercurrent affections showed no lesions of tuberculosis on *post-mortem* examination, and eighty-four of the eighty-five guinea-pigs that lived until they were killed showed no lesions of any kind on autopsy. One guinea-pig of the eighty-five showed lesions very slightly resembling tuberculosis, but these were proved by microscopic examinations and guinea-pig inoculation tests to be free from tubercle bacilli.

Discussion of Results.

Among the forty-two cattle, twenty-seven, or 64¼ per cent., were shown by microscopic examinations to be discharging tubercle bacilli from their bowels—in most instances intermittently—and the infectious character of the fæces in seven cases, or 16⅝ per cent., was

demonstrated by animal experiments—that is, feeding and inoculation tests.

These two facts—that twenty-seven of the cattle were shown by microscopic tests to be expelling tubercle bacilli *per rectum*, while only seven were proved by animal experiments to be passing infected fæces—must not be taken as being in any sense contradictory, as the fæces of only a sufficient number of tuberculous cattle were tested by animal feeding and inoculation experiments to prove conclusively that the acid-fast bacilli found on microscopic examinations in the fæces of tuberculous cattle are certainly live, virulent tubercle bacilli.

Relative to the expulsion of tubercle bacilli from the bowels of tuberculous cattle, all the evidence we have indicates that the bacilli have their origin in the lung and throat, from which regions they are coughed up, swallowed, and passed through and out of the intestinal canal without appreciable loss of pathogenic virulence. That a large proportion of the tubercle bacilli swallowed by cattle really pass through their bodies and out *per rectum* without a determinable loss of virulence was experimentally shown in some of our earlier work. We have absolutely no reason to believe that tubercle bacilli enter the intestinal canal from the lymph radicals or blood capillaries or by any complex and mysterious system of transportation from lesions of all descriptions and kinds in any or every portion of the body. It is our conviction that, unless an open tuberculosis is in more or less direct communication with the intestinal canal, or there is a tuberculous disease of the intestine itself, which latter is rare among cattle, no tubercle bacilli will be expelled with the fæces.

If tuberculosis in all its forms was a bacteriæmia the expulsion of tubercle bacilli from the bowels of all tuberculous individuals, as well as with their urine, saliva, milk, and other bodily secretions, would follow as a natural consequence. Those who have carefully studied the secretions from the uninvolved organs of tuberculous subjects know how rarely tubercle bacilli are detected in them even with the application of the most delicate tests.

When we consider cattle like Nos. 533, 549, and 552, and note that they were so badly diseased that they would have been condemned on superficial examination as wholly unfit for use as food under the existing meat inspection regulations, the absence of tubercle bacilli from their blood may be regarded as a sufficient reason for assuming that the possible occurrence of tubercle bacilli in the blood of tuberculous animals will almost invariably be associated with pathological conditions of a very marked character, or that the tubercle bacilli will be present in extremely small numbers and will speedily be filtered out of the blood stream. Cow 533 had been affected with tuberculosis two years or longer, was in poor condition as a result of the disease, and on autopsy was found to have an extensive, open tuberculosis of the lung and lesions of tuberculosis in the liver and in both the thoracic and abdominal lymph glands. Cow 549 was, if anything, even more severely and extensively affected, and had given birth to a congenitally tuberculous calf less than a year before her blood was injected into guinea-pigs. Cow 552 was also affected with a generalized, advanced, open tuberculosis, and prior to the use of her blood for the guinea-pig injections was found to be passing from her bowels large numbers of tubercle bacilli, which were proved by feeding tests

to be virulent for hogs and by inoculation tests to be virulent for guinea-pigs. With the blood obtained from these three cows fourteen guinea-pigs were injected, of which two died prematurely, and twelve lived two months or more afterwards, until they were intentionally killed, when they were found on *post-mortem* examination to be wholly free from lesions of disease of any kind.

Supplemental Tests regarding Possible Immunity.

We have already stated that the possibility exists that the intra-peritoneal injection of from 3 to 5 c.c. of fresh, warm blood from tuberculous cattle induces an immunity in guinea-pigs to the tubercle bacilli the blood may contain. Although we knew of nothing to uphold this theory, we considered it necessary to undertake an investigation to prove or disprove it, the results of which are now presented.

On April 24, 1909, blood and tuberculous material was obtained from Cow 533 for a number of guinea-pig injections. The primary object of the injections was to prove that the blood of a tuberculous cow, when introduced into the peritoneal cavity of a guinea-pig, has no retarding influence on the development of tuberculosis from tubercle bacilli that may be present in it.

Cow 533 was first bled from the jugular vein and then at once killed. As soon as she was dead a tuberculous mediastinal gland was removed from her body and 500 mg. of it emulsified with 2 c.c. of sterile, normal salt solution. Cover-glasses of this emulsion, stained with carbol-fuchsin and decolorized with 20 per cent. sulphuric acid, revealed on microscopic examination, on an average, two tubercle bacilli each. The emulsion was mixed with an additional quantity of sterile, normal salt solution, so that each cubic centimetre of the dilution represented a strength equal to one drop of the original emulsion.

The blood obtained from the cow prior to her death and the diluted emulsion made with the tuberculous mediastinal gland from her body were used to inject seven groups of guinea-pigs.

The guinea-pigs in the seven different groups were injected for the following purposes: Group 1, to serve as checks on the absence or presence of tubercle bacilli in the blood of the tuberculous cow that was used for the investigation; Group 2, to show that the intra-abdominal injection of fresh, warm blood from a tuberculous cow cannot protect against tubercle bacilli simultaneously introduced into the abdominal cavity; Group 3, to show that the intra-abdominal injection of fresh, warm blood from a tuberculous cow cannot protect against tubercle bacilli introduced into other parts of the body than the abdominal cavity; Groups 4 and 5, to show that the blood of tuberculous cows has no special germicidal potency for tubercle bacilli; Groups 6 and 7, to serve as guides relative to the amount of tuberculous disease to be expected in the bodies of the guinea-pigs that were injected with both blood and emulsion of tuberculous material.

The autopsy records of the guinea-pigs show, in a general way, very little difference between the animals that received only tuberculous emulsion and those that received both blood and emulsion. The guinea-pigs that received both blood and emulsion into their abdominal cavities showed numerically more extensive lesions of tuberculosis than

the guinea-pigs that received only emulsion into their abdominal cavities. This condition would naturally be expected, because the same number of tubercle bacilli contained in 3 c.c. of blood would be more widely separated and in better condition to start a large number of individual lesions than those in 0·5 c.c. of salt solution.

The use of an emulsion of tuberculous tissue from the tuberculous cow that supplied the blood for the supplemental injections was preferred to the use of a pure culture of tubercle bacilli, because it seemed desirable to us to use infectious material and blood in this instance from the same individual case of tuberculosis.

The total number of guinea-pigs injected in this supplemental investigation was forty-eight, of which eight received blood only, thirty-two both blood and tuberculous material, and eight tuberculous material only. Of the thirty-two that received both blood and tuberculous material and the eight that received only tuberculous material, six died prematurely, and the remaining thirty-four, when they were killed—thirty to thirty-one days after the injection—were all found to be affected with tuberculosis of a form that would have progressed to death in a short time.

Among the eight guinea-pigs that received an injection of fresh, warm blood without the addition of tuberculous material, one died prematurely and the remaining seven were found on autopsy to be free from lesions of disease. Since the cow that supplied the blood for the injections was affected, as her record shows, with extensive, advanced tuberculosis, the seven guinea-pigs make a strong addition to the eighty-eight parallel cases of which the records have been previously given; and hence we have ninety-five guinea-pigs as the total number that received injections of blood from tuberculous cattle into their peritoneal cavities—the most delicate test for tubercle bacilli available—and survived the injection long enough for tuberculosis to manifest itself clearly. Among this total of ninety-five guinea-pigs not one case of tuberculosis developed.[1]

Conclusions.

(1) We failed utterly to find tubercle bacilli in the blood of tuberculous cattle which we examined microscopically in accordance with the method described and used by Dr. Rosenberger.

(2) The negative results of our microscopic examinations are confirmed by the negative results obtained with ninety-five guinea-pigs,

[1] An independent investigation relative to the occurrence of tubercle bacilli in the circulating blood of cattle was made in the Bureau of Animal Industry by Dr. John R. Mohler, Chief of the Pathological Division. Mohler examined the blood of eight cattle microscopically, and with blood from each of these cattle injected five guinea-pigs. The microscopic examinations and injections were made precisely in the manner described by Dr. Rosenberger. No tubercle bacilli were discovered microscopically, and not one of the forty injected guinea-pigs contracted tuberculosis. Two of the eight cattle were in good condition, but were passing tubercle bacilli from their bowels; two of the cattle were in poor condition and were passing tubercle bacilli from their bowels; and four of the cattle were slaughtered for meat, but on inspection were found to be so extensively affected with tuberculosis that it was necessary to condemn and tank their carcasses under the Federal meat inspection regulations. This evidence, kindly presented to us by Dr. Mohler, raises the number of tuberculous cattle from which blood was tested to fifty, and the number of guinea-pigs that received injections of blood from tuberculous cattle without contracting tuberculosis to 135.

each of which received an intra-abdominal injection of blood from a tuberculous cow or bull.

(3) As the number of cattle from which blood was injected into the ninety-five guinea-pigs was forty-two, and as these cattle represented practically all stages of tuberculosis, from mildly affected recent cases to old and completely generalized cases, we feel that our work shows beyond the remotest doubt that tuberculosis is not to be classified, in any sense of the word, as a bacteriæmia.

(*Bulletin* 116.)

THE KEEPING OF PIGS.

Taste in the matter of pig-keeping varies a good deal in different parts of the world and, indeed, of the British Isles, and those who have wandered about the rural districts of Ireland must have felt that difficulties might arise in any very vigorous attempt to exact a very high standard in the matter. But even in Ireland common consent has accepted a different standard for urban as against purely rural districts. In England and Wales Section 47 of the Public Health Act, 1875, provides for a penalty against any person who in an urban district keeps any swine or pigsty in any dwelling-house, or so as to be a nuisance to any person, while Section 91 provides that any animal so kept as to be a nuisance or injurious to health is an offence. Although in England swine are very rarely, if ever, found actually kept in dwelling-houses, they are frequently, especially in some districts where the pork industry flourishes, kept under eminently undesirable conditions, and in this connection a correspondent refers to an instance in which premises under a carpenter's workshop have been let, and the tenant keeps pigs therein.

It is not quite clear from our correspondent's communication whether the pigs are kept in a part of the premises in actual occupation of the new tenant, or whether the tenant simply uses all the premises for the purpose of pig-keeping. In any case the stench arising from the pig-keeping is so great that the carpenter cannot persue his calling, and our correspondent asks whether the odour is injurious to health. It seems to us that the case is one, whether in an urban or rural district, in which the local medical officer of health and sanitary inspector ought to be able to afford the carpenter relief, and if by any chance the circumstances were such that the Public Health Act would not touch this case, possibly the carpenter might obtain redress at common law. In many places by-laws have been sanctioned relative to the minimum distance from dwellings at which pigs may be kept, and we believe that a distance of 100 ft. has been allowed in some instances. The pig is the victim of what Dr. Ballard, in his classic writings on offensive trades and the like, regards as a mistaken popular prejudice, and this prejudice militates against any trouble being taken to keep pigs in a cleanly state. In Ballard's view the pig is naturally a clean, not a dirty animal, and his wallowing in the mire has for its object cutaneous cleansing, the mud standing to the pig in relation to soap to the human being, this mud when dry caking and falling off and carrying with it the hairs and cutaneous *débris* which irritate him.

Similarly Ballard is found in defence of the good habits of the pig. The animal, according to him, does not habitually prefer disgusting food. In the wild state the pig does not eat garbage, but acorns, roots, and fallen fruits. It is said, too, that pigs which are provided with outdoor runs will never foul their beds, and that on very large pig runs, where pigs are provided with shelters for the night, a pig fouling the common bed is very severely handled by his fellows. There can certainly be no question that pigs may easily be kept in a cleanly state in properly constructed sties, and the more modern by-laws in reference to pig-keeping have relation more to the method of keeping the pigs than to the position of the sties. Experience shows that pigs kept in a thoroughly cleanly state thrive better than when in filth, and the nuisance relating to pig-keeping may by the exercise of moderate care be reduced to very small dimensions.

(*Lancet.*)

THE SECOND INTERNATIONAL FOOD CONGRESS.

By LOUDON M. DOUGLAS.

Edinburgh.

The First International Food Congress was held at Geneva, under the auspices of the White Cross Society of Geneva, and the results attained there were of such a highly satisfactory character as to warrant the promoters in looking forward to an even more successful Congress during the present year. It was determined to hold the second Congress in Paris, and so continue the good work so well begun. At Geneva pure food in all its branches was defined, as also alimentary substances such as drugs and ice. This Congress was devoted to the definitions of such operations as might be recognized in the manufacture of alimentary substances. In passing, it may be said, that when these definitions are complete they will form a guide of an irreproachable character to all who are concerned in the production or handling of food and alimentary substances. It will not be possible, however, to translate into law the various findings until analytical methods are unified and a complete system of standardization has been set up in every country. Next year's Congress will most likely be devoted to this work, and, to judge from the numbers attending at Paris, there is every likelihood that, wherever it is held, it will attract enthusiastic food specialists from all parts of the world.

The Paris Congress was an undoubted success. It was held in the College of Medicine, Paris, which was kindly given up by the Faculty to its deliberations during the week, October 17 to 24 inclusive, and, although the halls are fairly large, they were crowded on many occasions when burning questions were being discussed. Over 2,000 members subscribed their names, and they hailed from twenty-eight different countries throughout the world, and such a large number taxed the secretarial staff to the utmost. Orderly arrangements, however, came out of it all, and, as promised, the official opening duly took place on Monday, October 18, and was presided

over by M. Ruau, the distinguished Minister of Agriculture of France, who was supported by Professor Bordas, President of the Congress.

The method of carrying on the Congress was very effective, the various food and alimentary substances being grouped together under a general heading, which formed the designations of Sections, and the order of procedure was as follows: Each subject was discussed and a definition arrived at by a vote. This definition, or resolution, was considered to be the finding of the Section, and was thereafter referred to the Hygienic Section, which discussed the matter from the point of view of health and hygiene.

This arrangement worked very well, and it is gratifying to say that in the Hygienic Section alone there were frequently over 500 interested people present, which shows that there was an amount of enthusiasm one would hardly have expected to find in connection with such a subject as the food supply.

The Sections were as follows: (1) Drinks, including wine, liquers, cider, beer, syrups, and vinegar. (2) Bakery products, including flour, bread, and pastry. (3) Confectionery, including sugar, honey, cocoa, and chocolate. (4) Grocery and spices, including tea, coffee, mustard, and salt. (5) Dairy produce, including milk, cream, condensed milk, butter, cheese, and eggs. (6) Meat industry, as also oils, edible fats, bacon curing, sausages, preserved fruits, and vegetables. (7) Drugs, essential oils, chemical products, mineral waters, and ice.

In all these Sections there were continuous discussions until resolutions were arrived at, and the results will be published in proceedings (*compte-rendu*) in due course, and this will form a complete book of reference on the sophistications of food and the limits to which such will be tolerated in all countries.

One of the most important discussions took place concerning dairy produce and the use of preservative in butter and other produce. It was decreed that "boron preservatives" were not only allowable, but were absolutely necessary in the manufacture of butter. It was also held that the addition of such a preservative should not require to be declared in future any more than the presence of salt would require to be declared, and thus the addition of preservative would be reduced to the regular operations recognized as being essential to the good conduct of the butter industry. It was also decreed that the standard water contents of butter should be raised from 16 to 18 per cent.

Milk, again, was considered to be only worthy of the name when derived from a healthy cow, and could only be regarded as pure when it did not contain any colostrum or any added matter whatever. The subtraction also of any portion of the fat was regarded as being an irregular operation. Pasteurization, filtration, and refrigeration were regarded as regular operations; but sterilization, creaming, and homogenization were declared to be facultative operations which should be announced at time of sale.

In the department of charcuterie an interesting discussion took place on the constitution of sausages, and it was finally determined that when the ingredients added to the sausages contained more moisture than the principal ingredient, the excess should be declared —that means that if bread or any similar farinaceous substance should be added to the sausages, and it contains more moisture than the meat, this would be looked upon as an added ingredient, and the

sausage should only be sold after the excess of moisture had been declared.

In connection with drugs much discussion took place, and a very interesting *brochure* was presented by the English delegation, and occupied a large part of the discussions. The result may be the appointment of an International Commission to more fully investigate the matter.

These brief references to the decisions arrived at will serve to indicate the kind of work done, and will also illustrate the fact that the various discussions were taken part in by men who were thoroughly competent to come to a decision on the various matters submitted to them.

One thing was very noticeable, namely, that it became plainer and plainer as the Congress progressed that there was hardly a substance in connection with the food supply which was not subjected to some kind of sophistication or adulteration, and it became evident also that if the means could be devised to prevent frauds in food it would be an immense gain to every nation, inasmuch as it appeared to be quite common in some industries to employ skilled chemists with a view to reducing the quality of the food, while preserving their external appearance, and that frauds of this kind are daily perpetrated. This more especially affects the poor, who are not in a position to judge of the purity of their food or control it in any way.

The City of Paris gave a reception, as did also the Minister of Commerce, and amongst the private hosts who generously entertained many visitors were Madame and Monsieur Paul Bolo, both of whom have shown from the beginning an enthusiastic interest in the work of the White Cross Society of Geneva. It is largely due to their generosity that the Society came into existence and has been able to accomplish so much good work.

This year's Congress will be held at either London, Rome, or Brussels; but it has not so far been determined which of these three cities will be selected.

Review.

THE REGISTER OF VETERINARY SURGEONS, 1910. Published according to Act of Parliament. Printed by H. and W. Brown, London, and published at The Royal College of Veterinary Surgeons, 10, Red Lion Square, Holborn, W.C. Over 400 pp. Price 3s. 6d. post free.

We have received a copy of the "Register of Veterinary Surgeons" revised to January 1, 1910. Last year we were pleased to note a number of improvements on previous issues, and we are now pleased to note a number of further improvements. There is now included a list of the members of the various standing Committees of the Council, and also a list of important dates of the year, such as dates of Council meetings and examinations. From the latter list we gather that the foreign voting papers were issued on February 1; that May 11 is the last day for nominations to Council; that May 18 is the day fixed for the issuing of the general voting papers, which must be returned not

later than May 25. In addition to a list of the members of the Army Veterinary Service, there is now a list of the Territorial Veterinary Service, which numbers almost 100 members. Appendix ix. consists of the Diseases of Animals Act, 1909.

It is interesting to note that the total number of Members of the Royal College of Veterinary Surgeons is now 3,372, being an increase of thirteen over last year's number. Two hundred and eighty-four Members are also holders of the Fellowship diploma. The registered practitioners now number 269, a decrease of eleven for the year.

The addresses of several members are noticed as missing. Such members should at once communicate with the Registrar (Mr. F. Bullock), in order to prevent their names being removed from the Register under the operation of Section 5 (4) of the Veterinary Surgeons Act. We congratulate the Registrar on the continued improvement in the usefulness of the Register.

Miscellaneous.

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(Dated February 8, 1910.)

ANIMALS (NOTIFICATION OF DISEASE) ORDER OF 1910.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1909, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:—

Application of Order.

(1) The diseases to which this Order applies are cattle plague, contagious pleuro-pneumonia of cattle, foot-and-mouth disease, sheep-pox, sheep-scab, swine fever, anthrax, epizootic lymphangitis, rabies, glanders and fascy, and the definitions of "disease" and "diseased" in the Diseases of Animal Act, 1894, are extended for the purposes of this Order accordingly.

Notification of Disease.

(2) (*a*) A veterinary surgeon or veterinary practitioner who in his private practice is employed to examine any head of cattle, or any sheep, goat, swine, horse, ass, or mule, or the carcase of any such animal, and is of opinion that the animal is diseased, or was diseased when it died or was slaughtered, or suspects the existence of disease therein, shall with all practicable speed give notice of the existence or suspected existence of disease to an inspector of the Local Authority, and also, except where the disease is anthrax, sheep-scab, glanders or farcy, to a constable of the police force for the police area in which the animal or carcase is, who shall transmit the information to the Board of Agriculture and Fisheries by telegram addressed "Agrifi London."

(*b*) An Inspector of the Local Authority on receipt of notice under this Order shall forthwith report the existence or suspected existence of disease to the Local Authority, and, if the disease is anthrax, glanders or farcy, also to the Medical Officer of Health of the Sanitary District in which the animal or carcase is.

(*c*) The notification of disease hereby prescribed shall be in addition to any notification prescribed by any other Order relating to the disease.

Communication of Information of Disease by one Local Authority to another.

(3) Where a Local Authority receives under this Order or otherwise information of the existence or suspected existence of disease in relation to a carcase of an animal that has died or been slaughtered in the District of another Local Authority, the Local Authority shall forthwith transmit the information to the other Local Authority.

Fee for Notification.

(4) (*a*) A veterinary surgeon or veterinary practitioner who under and in accordance with this Order gives notice of the existence or suspected existence of disease to an Inspector of the Local Authority shall be entitled to receive from the Local Authority a fee of two shillings and sixpence for each notification.

(*b*) Where two or more animals or carcases are examined by a veterinary surgeon or veterinary practitioner on the same premises and at the same time and are found to be diseased, or are suspected of being diseased, one fee only shall be payable to him in respect of the notification of the existence or suspected existence of disease in such animals or carcases.

Commencement.

(5) This Order shall come into operation on the first day of April, nineteen hundred and ten.

Short Title.

(6) This Order may be cited as the "Animals (Notification of Disease) Order of 1910."

In witness thereof the Board of Agriculture and Fisheries have hereunto set their Official Seal this eighth day of February, nineteen hundred and ten.

T. H. Elliott,
Secretary.

Translations.

HYPERTROPHIC CIRRHOSIS OF THE LIVER AND BILIARY LITHIASIS.

By M. E. HONDEMER.

Veterinary Surgeon to the Mounted Batteries of the Algiers Division at Hussein-Dey.

On May 1, 1907, the mare Sagesse, aged 9, is brought to the infirmary with colic. She is not long in showing vertiginous trouble; she pushes violently agaiust the wall and grinds her teeth; the lips move convulsively; the body is covered with sweat.

These signs of excitement recur, interrupted by periods of relative calm. The above symptoms are co-existent with chronic intestinal indigestion: dull pains, absence of borborygmus, defæcation, and meteorism, cause one to diagnose abdominal vertigo.

Treatment varies. Bleeding, refrigeration of the brain, injections of pilocarpine, ammoniacal drinks, glycerinated injections, purgatives, puncture of the cæcum, &c., are used against the affection. But up to May 11, date of death, no betterment occurs; weakness becomes accentuated, and the invalid dies comatose.

Autopsy.—After ablation of the intestinal mass the liver appears bound to the duodenum by a bile-duct, whose diameter is larger than that of the small intestine. One feels inside this conduit a rounded, hard body, a little less in size than a fist. Its incision gives issue to a flood of brownish bile, thick and viscid, holding in suspension veritable gravel.

The obstruction and distension of this canal are due to a voluminous calculus of greenish, orange and brown tint, having the considerable weight of 230 grammes. The liver is affected with hypertrophic cirrhosis. Isolated, it weighs 15 kilogrammes (about 33 lb.). It resists pressure; its parenchyma, decolorized, grates when incised. On section one distinguishes brownish points (deformed hepatic lobules) surrounded by a whitish zone of fibrous aspect (hyperplased perilobular conjunctive tissue).

Incising the ducts of the different lobes of the liver, one sees them considerably dilated, stuffed with numerous concretions, varying in shape and size from that of a grain of sand to a pigeon's egg. All these concretions are made up of concentric layers of biliary salts. This autopsy, interesting from the point of view of the lesions, seems to show (1) that biliary lithiasis, even when pronounced, can co-exist with a state of apparent health (a fact noted by Leclainche in "Précis de pathologie interne," "*Maladies interne du cheval*"); (2) that diagnosis affections of the liver in solipeds is difficult.

The existence of hepatic calculi is ordinarily interpreted by periodic colic, having the character of intestinal indigestion and accompanying icterus.

The mare Sagesse had shown at different times symptoms of intestinal indigestion; but the yellowish tint of the apparent mucosa had never been sufficiently pronounced to make one think about liver trouble. A very profound clinical examination would alone make one suspect the cause of the dizziness. Percussion would have revealed an area of dulness behind the right hypochondria. Palpation might

have given useful information by reason of the very distinct hypertrophy of the hepatic mass.

Examination of the fæces has not been practised; defæcation was suspended. In case of normal evacuations excretions should have presented the following characters: Decoloration, stearated appearance; putrid odour.

Analysis of the urine would have been a very valuable procedure. One would have almost certainly obtained Gmelin's reaction.

These different researches have, unfortunately, not been practised, fascinated as one was by the dominant symptoms of intestinal indigestion and vertigo. An exact diagnosis would certainly not have saved the invalid; but it would have satisfied her medical attendant.

(*Revue Générale de Médecine Vétérinaire.*)

BIER'S THERAPEUTIC METHOD.

By LEMIRE and DUCROTOY.

The authors trace the history of Bier's method from the experiments of Ambrose Paré up to the time of the publication of Bier's work, "Hyperæmia as a Curative Means."

The principal ways in which the hyperæmia acts is by an analgesic, bactericidal, resorptive, resolutive, nutritive and regenerating effect. The method of obtaining *active hyperæmia* by heating boxes is hardly applicable to veterinary practice, where the old vesicants and rubefacients are retained. But it is in *passive hyperæmia* that the authors proclaim the most interesting developments. They study the technique of elastic bandages and of cupping glasses, and arrive at the following conclusions:—

(1) *Elastic bandages* can only be applied usefully on terminal regions, and one can only think of treating by them affections situated on the inferior parts of the limbs, below the hocks and knees, or at the head.

They can give excellent results; but appreciation of them fails to measure the degree of compression. Their use easily exposes the skin to sloughing, and to sum up the method, is a personal one, and is susceptible of giving very different results in the hands of diverse operators.

(2) *Cupping*[1] is a simple means which does not require special apparatus, and for which a glass suffices, with a little wadding or other inflammable material to rarify the air at the time of application.

MM. Lemire and Ducrotoy demonstrate the good foundation of their conclusions from fifty-eight personal clinical observations made up as follows:—

[1] To the part to be operated on, a flannel or sponge soaked in hot water is applied in order to bring blood to the part, a cupping glass is then put on, into which some inflammable material, *e.g.*, a piece of paper soaked in spirits of wine has been placed. Place one edge of the glass on the skin, ignite the spirit, and press the glass down; it will adhere by suction. Fix two or three glasses this way, and to the centre of each swelling of the skin they raise apply a scarifier, operating rapidly, then re-apply the glasses, and they will fill with blood to the required quantity.—*Translator.*

1	phlebitis of the saphena	1 cure.
1	open arthritis of the fetlock	1 cure.
2	open arthritis of the hock	2 checks.
1	temporo-maxillary arthritis	1 cure.
7	deep injuries to the coronet	4 cures. 3 checks.
2	penetrating wounds of the plantar region... ...	2 cures.
1	cartilaginous injury	1 cure.
5	sore throats	5 cures.
2	lymphangitis of the limbs	2 checks.
2	strains of the flexors	2 checks.
7	strains of the perforatus	2 cures. 5 checks.
2	strains of the suspensory	1 cure. 2 checks.
1	strain of the fetlock joint	1 cure.
16	contused wounds	16 cures.
5	penetrating wounds	4 cures. 1 check.

They make no allusion about the many inconveniences of the method which are: (1) The impossibility of placing elastic bandages above the elbow and the stifle; (2) insufficiency and imperfection of means to enable us to judge of the quality of the stasis; (3) difficulty of obtaining immobility in animals; (4) constant supervision of the invalids; (5) the objections they can evince; (6) sloughing and local atrophy resulting from compression a little too strong and prolonged.

(*Revue Générale de Médecine Vétérinaire.*)

Books and Periodicals, &c., Received.

Register of Veterinary Surgeons; Transvaal Agricultural Journal; Bulletins of the Bureau of Animal Industry; Bulletins of the Sleeping Sickness Bureau; Rhodesian Agricultural Journal; Proceedings of the Royal Society of Medicine.

Letters and Communications, &c.

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